USBOSDM2

USB-Powered MPEG2 Encoder with Picture-in-Picture & Text/Graphics Overlay

Application Software User Manual

Version 1.0.3

Table of Contents

1. Main Features and Functions

USBOSDM2 is a multi-I/O, colour OSD and hardware MPEG USB encoder with many powerful features:

--- Real-time encode MPEG1, MPEG2 video from 1 Mbps to 25 Mbps using hardware compression chipset

--- Encode 4 video input into one MPEG stream as picture-in-picture in arbitrary position and size

--- Encode unlimited colour text/graphics overlay (OSD) items as integral part of the MPEG video

--- Fully USB-Powered, no AC adaptor is needed, plug-and-play under MS Windows 7, Vista and XP

--- Real-time live preview video on PC screen in arbitrarily re-sizable and movable window or full screen

--- 2 set of video/audio output sockets allow real-time output inc. picture-in-picture and OSD to external TV

--- 4 Video Input Channels, selectable from 5 Composite and 1 SVideo Sockets with PAL or NTSC signals

--- 4 Audio Input Channels, selectable from 4 Stereo Line-in and 2 Stereo Mic. input sockets

--- Perfect Audio/Video Synchronization is always maintained in the recorded and streamed MPEG video

--- Record video as MPEG files: files can be manually split or automatically split at fixed time or length

--- Record using timer or calendar scheduler with daily or weekly repeat options

--- Real-time stream video over IP network multi-cast or uni-cast independent of file recording status

--- Real-time flip/mirror any input video horizontally or vertically

--- Real-time enlarge input video at any point inside video frame (2-times zoom-in)

--- PAL and NTSC encoding at 720X576, 720X480, 480X576, 480X480, 352X288, 352X240-Pixels

--- DVD, SVCD, VCD, MPEG2, MPEG1 encoding format fully user-selectable

--- Multiple **USBOSDM2** devices (up to 8) can run simultaneously on one PC under the same software

--- OSD text, timer, graphics, rectangle, box, and geometric shapes with different colour, alpha and blink

--- OSD text/timer can use any PC font in any size, typeface, style, colour, in transparent or opaque mode

--- Each input video channel can have boundary on or off

--- Each input video channel has colour brightness, contrast, hue, saturation and sharpness control

--- Each input audio channel has hardware gain control and left/right mute

--- Recording file name can have user-defined fields inc. recording quality, date/time, serial number etc

--- Still images can be grabbed in bmp, jpg, gif, tiff, and png format

--- Live recording status can be displayed inside video frame with user-definable colour and font

--- Colour Bar generation to test video output capability

--- Can record/stream MPEG Video with Text/Graphics Overlay when no input signal is available

--- Optional Comprehensive Software Development Kit (**SDK**) for writing customized application software

2. Package Contents

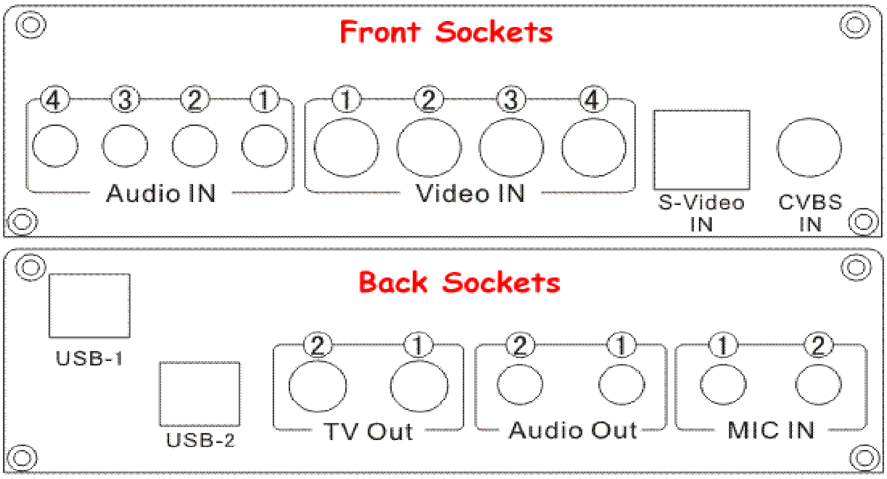
USBOSDM2 comes with the device box, application software, USB and video/audio cables.

3. Minimum System Requirement

Hardware: Intel-Pentium4/AMD-Athlon PC with 2 USB2 sockets, 512MB RAM, 128MB Video card.
Software: MS **Windows7**, **Vista** or **XP** SP2, DirectX9 with DirectDraw Hardware Acceleration enabled.
Operating Environment Temperature: Below 30 °C.

4. Hardware Installation

Plug the two USB cables into the PC's USB sockets, **note** sockets from separate USB Hubs are NOT recommended because they usually cannot support enough power to run **USBOSDM2** properly.
Connect any video/audio device's video/audio output sockets to the input sockets on **USBOSDM2.**
Optionally, VCR or TV can be connected to the **TV OUT 1** or **TV OUT 2** sockets.



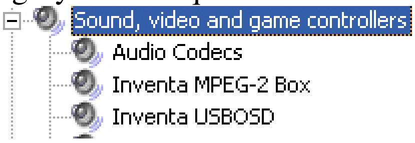
Note 1: All **USBOSDM2** devices must be connected and device driver installed before the application software can start, **USBOSDM2** device **cannot be added or removed** when the software is running.
Note 2: Do not plug cables to both the rightmost "SVideo" & "CVBS" sockets, use one at a time only!

5. Software Installation

Installation includes **Device Driver** software and **Application** software (the optional **SDK** software installation is described separately in its own manual), either one can be installed first:

■ Device Driver Software Installation

Once the **USBOSDM2** device is connected to a PC, the Windows will inform new device is found and ask for the location of device driver software: indicate to Windows the device driver software is located either at the installed application software folder (usually C:\Program Files\Inventa\USBOSDM2) or on the Setup CD, ignore Windows' warning messages claiming the driver was not passed Windows' Logo testing etc., proceed to install the device driver until two device drivers -- "**Inventa MPEG-2 Box**" and "**Inventa USBOSD**" -- appear under the "ControlPanel->System->Hardware->DeviceManager->Sound, video and game controllers" category without question mark and exclamation mark:



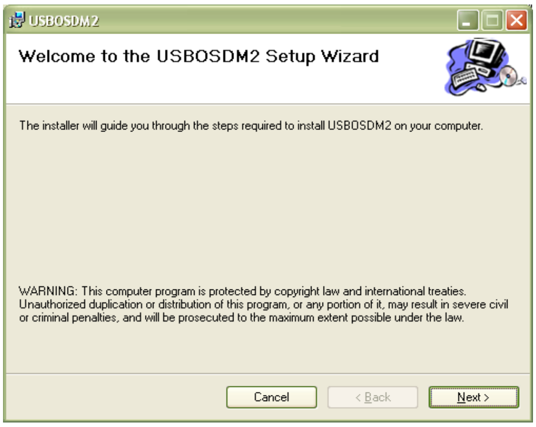
Sound, video and game controllers
Audio Codecs
Inventa MPEG-2 Box
Inventa USBOSD

Note 1. For multiple **USBOSDM2** devices, each device will have a pair of "**Inventa MPEG-2 Box**" and "**Inventa USBOSD**" drivers listed.

Note 2. USB devices with the same hardware IDs as **USBOSDM2**, e.g. Inventa's "**USBMPEG2-Box**", DVICO's FusionMPEG2, etc., should not be used simultaneously with **USBOSDM2** on the same PC.
Note 3. Click "All Programs->Inventa->USBOSDM2->Install Drivers" can also install/re-install drivers.

■ Application Software Installation

Once the Setup CD is inserted into PC's CD drive, the "Setup Wizard" window will appear:

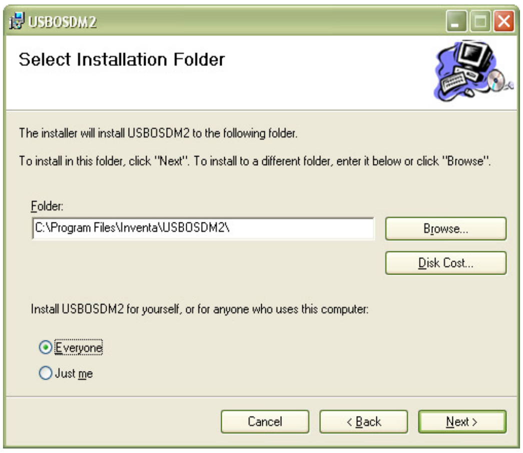

USBOSDM2

Welcome to the USBOSDM2 Setup Wizard

The installer will guide you through the steps required to install USBOSDM2 on your computer.

WARNING: This computer program is protected by copyright law and international treaties. Unauthorized duplication or distribution of this program, or any portion of it, may result in severe civil or criminal penalties, and will be prosecuted to the maximum extent possible under the law.

If this window does not appear double-clicking the "**Start.exe**" file on the CD can bring up this window. From this window, proceed to install **USBOSDM2**'s application software ---- this can be done either before or after the device driver has been installed as described in the previous section.


USBOSDM2

Select Installation Folder

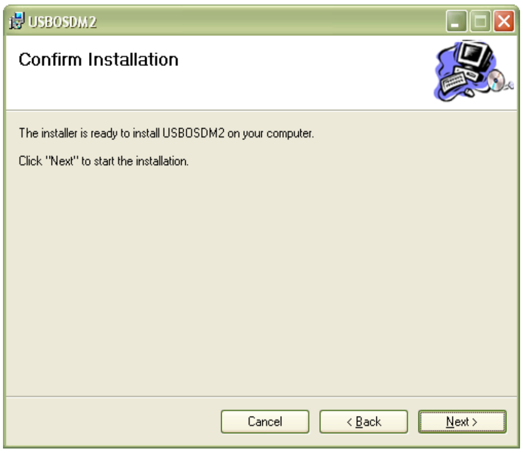
The installer will install USBOSDM2 to the following folder.

To install in this folder, click "Next". To install to a different folder, enter it below or click "Browse".

Folder:
C:\Program Files\Inventa\USBOSDM2\

Install USBOSDM2 for yourself, or for anyone who uses this computer:

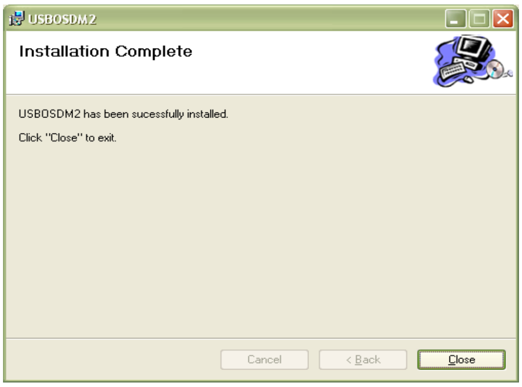
● Everyone
○ Just me


USBOSDM2

Confirm Installation

The installer is ready to install USBOSDM2 on your computer.

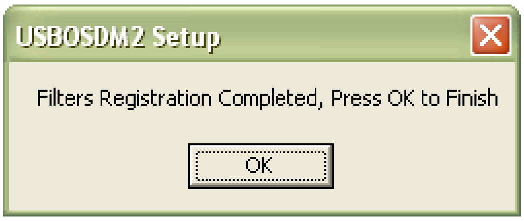
Click "Next" to start the installation.


USBOSDM2

Installation Complete

USBOSDM2 has been sucessfully installed.

Click "Close" to exit.

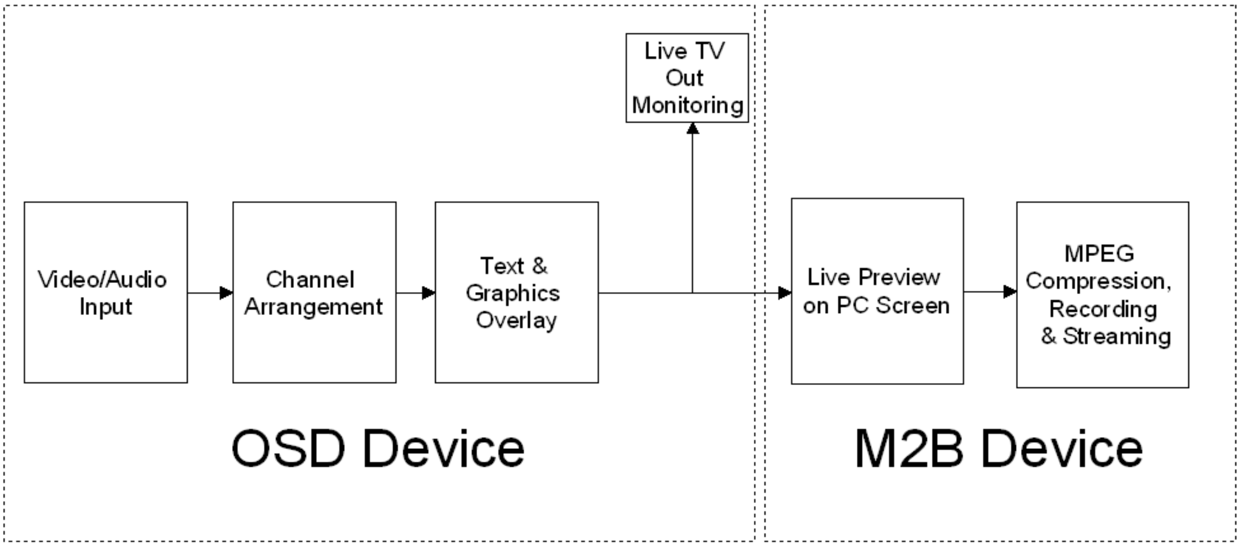

USBOSDM2 Setup

Filters Registration Completed, Press OK to Finish

Note the end of installation is the "**Filters Registration Completed**" window: click the "**OK**" button on this window will finish the application software installation and put the USB SD icon on the Windows' desktop. Mouse double-clicking this icon will launch **USBOSDM2** application software: it can also be launched (or un-installed) from Windows' "**Start->All Programs->Inventa->USBOSDM2**" menu.

6. Device Architecture

USBOSDM2 contains several major hardware/software processing units as illustrated below:

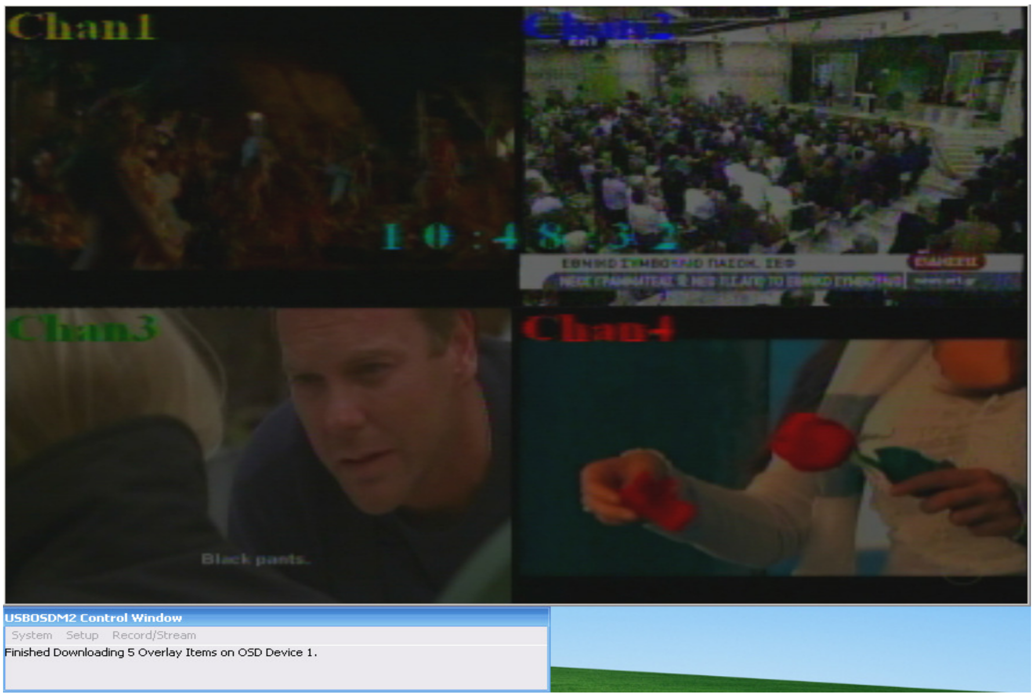


USBOSDM2 Device Architecture

As seen in the picture, **USBOSDM2** can be viewed as consisting of an **OSD** device and an **M2B** device: input signals are first mixed, geographically arranged and text/graphics overlaid by the **OSD** device, then MPEG-compressed, recorded, streamed and live-previewed on PC by the **M2B** (MPEG2-Box) device. This two-device principle has been used throughout the **USBOSDM2** Application Software programming and therefore will be followed similarly in this software user manual. Note on the device's back panel, the bottom USB socket is for the **OSD** device, the top USB socket is for the **M2B** device.

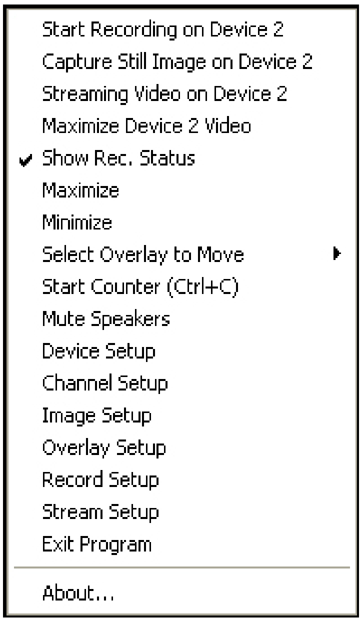
7. User Interface

On start up, **USBOSDM2** software presents a **Video Window** and a **Control Window** on PC screen:



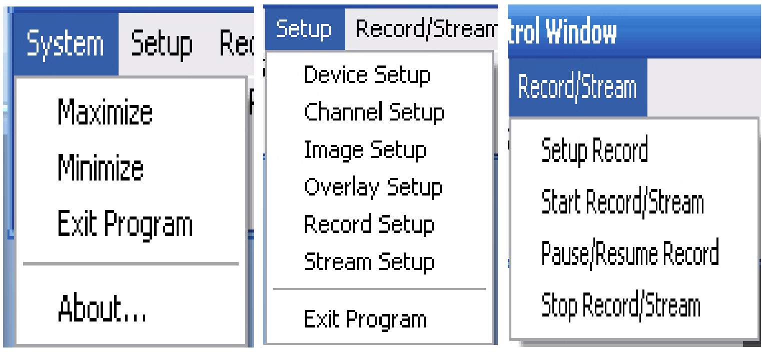
Finished Downloading 5 Overlay Items on OSD Device 1.

Right-mouse single clicking inside the **Video Window** will also display a **Drop-down Menu:**



a. Control Window

The **Control Window** allows menu items to be selected from top-level main menu **System**, **Setup**, or **Record/Stream**:



; it also displays operation feedback status at the area below the menu bar. Left-mouse clicking the title area of the **Control Window** then dragging it will move the **Control Window** and the **Video Window** together around PC screen. The entire program can be ended by selecting “System->Exit Program” menu item.

The **Control Window** cannot be resized but will become hidden on the Windows’ Taskbar together with the **Video Window** when “System->Minimize” menu item is selected.

b. Video Window

The **Video Window** is always located above the **Control Window**: it can be resized by left-mouse clicking its edges then dragging. Left-mouse double-clicking inside **Video Window** will make it to enter **Full-Screen** mode: video content will occupy the entire desktop area in front of all other windows (double-clicking again or pressing the Space-Bar will revert back to normal window mode). Left-mouse single-clicking inside **Video Window** then dragging it will move the **Video Window** and **Control Window** together around the desktop area.

When multiple **USBOSDM2** devices are connected, all devices’ video contents will be displayed side-by-side within the **Video Window** from left to right each with equal width.

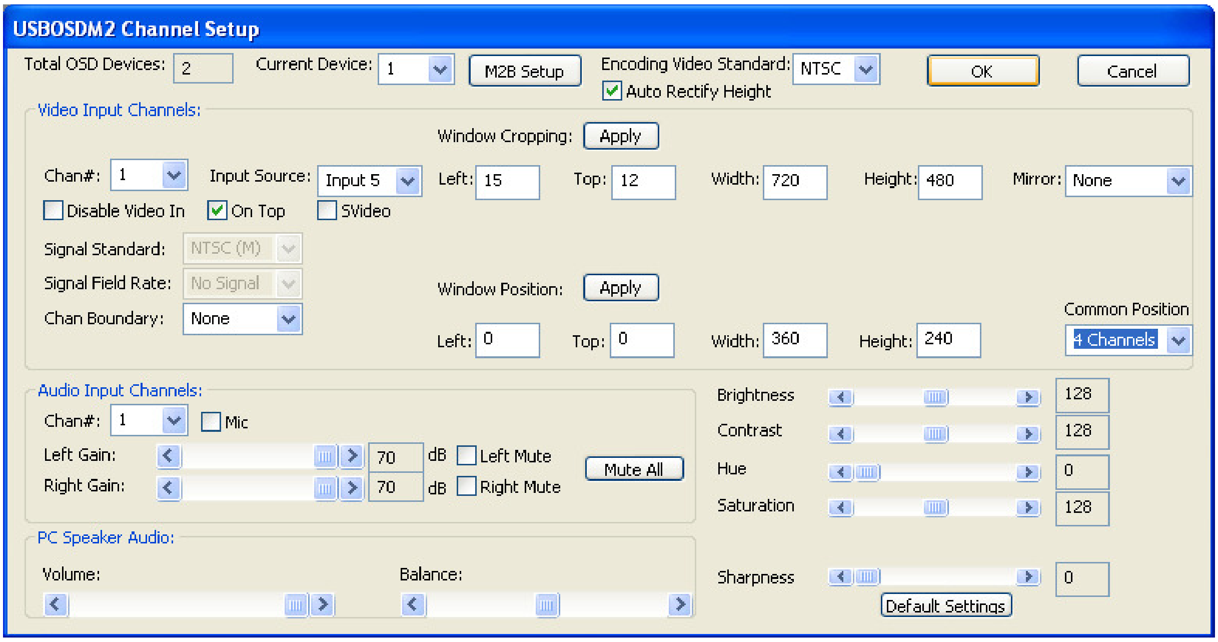
The **Video Window** can also show **USDOSBM2** device’s recording status when recording is started.

c. Drop-down Menu

Drop-down Menu appears when Right-Mouse-Button is singled-clicked inside the **Video Window**. Apart from displaying various menu items for selection, the **Drop-down Menu** also reflects one **USBOSDM2** device's status: if recording is on, paused or off, streaming is on or off, recording status is on, audio speakers are muted, etc.

8. Channel Setup

The **Channel Setup** window controls video and audio channels' incoming signal configuration and channels' video window arrangement. This window can be brought up from the **Control Window**'s **Setup->Channel Setup** menu item, or from the **Drop-down Menu-> Channel Setup**:



USBOSDM2 Channel Setup

Total OSD Devices: 2 Current Device: 1 Encoding Video Standard: NTSC ☑ Auto Rectify Height

Video Input Channels:

Chan#: 1 Input Source: Input 5

□ Disable Video In ☑ On Top □ SVideo

Signal Standard: NTSC (M)

Signal Field Rate: No Signal

Chan Boundary: None

Window Cropping: Left: 15 Top: 12 Width: 720 Height: 480 Mirror: None

Window Position: Left: 0 Top: 0 Width: 360 Height: 240

Common Position: 4 Channels

Audio Input Channels:

Chan#: 1 □ Mic

Left Gain: 70 dB □ Left Mute

Right Gain: 70 dB □ Right Mute

Brightness 128

Contrast 128

Hue 0

Saturation 128

Sharpness 0

PC Speaker Audio:

Volume: Balance:

a. Video Channel Setup

i. Video Channel Features

Each **OSD Device** has 4 simultaneously available video input channels named as Chan1 ~ Chan4: each of them has its own video window inside the **Device**'s entire video frame and can be individually arranged inside the **OSD Device**'s video frame, it is this entire video frame consisting of the 4 video channel windows that will be sent to the **M2B Device** to be encoded as one MPEG video stream then recorded as one file or streamed out over IP network. Each video input channel has its own features to be setup:

- **Input Source**: From which socket this channel receives video signal – can be one of **Input1**, **Input2**, **Input3**, **Input4** or **Input5**, corresponding to the Input Video Sockets on the front of **USBOSDM2** device box: the Input1~Input4 sources always use Composite(RCA) socket, while the Input5 source can select either CVBS(same as RCA) or SVideo socket (Do not plug cables into these two sockets for **Input5** simultaneously, use one at a time only!). Note more than one channels can simultaneously receive signal from the same Input Source.

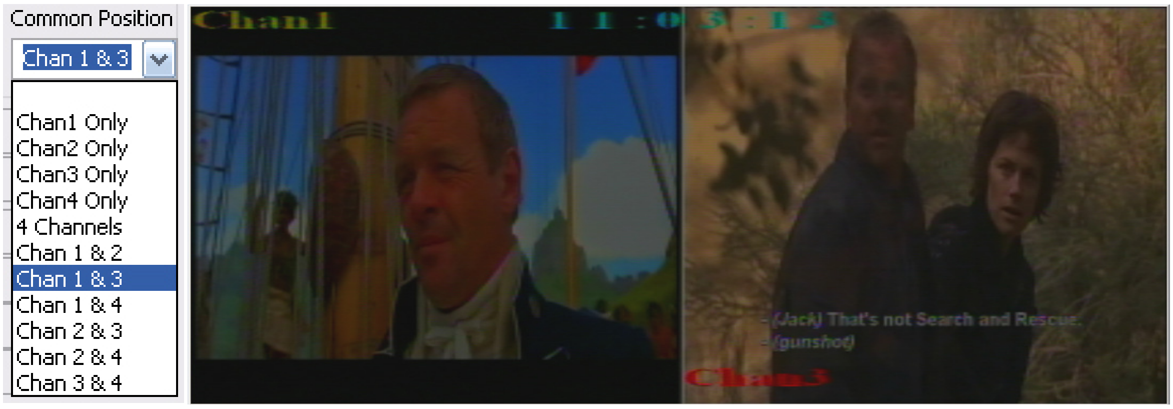
- **Disable Video In**: Disable video input to this channel: will not affect other channels' video input.
- **On Top**: If this channel has display priority over other channels when this channel overlaps with other channels. When two or more video channels overlap, how to display the overlapped area depends on this display priority: channels with "**On Top**" ticked have higher priority than channels that do not have "**On Top**" ticked. If two channels have the same "**On Top**" ticking or

not-ticking status, then the lower-numbered channel has higher display priority. For example, if channel 1 and channel 2 overlap, the overlapped area will show channel 1's video if both channels have "**On Top**" ticked or not ticked in the same way. However, if channel 1 has "**On Top**" not ticked while channel 2 has "**On Top**" ticked, then the overlapped area will show channel 2's video**.**

- **Window Cropping**: How many pixels from left or top of the original raw video frame will be chopped off, and how many pixels in width and height a video frame will have. When **USBOSDM2** hardware digitizes incoming analogue video, it generates an original raw video frame larger than PAL or NTSC video frame's standard 720X576 or 720X480 pixel size, **Window Cropping** defines the left, top, width and height positioning of a standard PAL / NTSC video frame fetched out of the original raw video frame. Note for PAL incoming signal, it's highly recommended to select 720X576 as its width and height, for NTSC incoming signal, select 720X480 as its width and height, otherwise erroneous display effect could appear.

- **Window Position:** The upper-left position and width, height of a channel's video window inside the entire video frame: width and height should not exceed a video frame's 720X576 (PAL) or 720X480(NTSC) maximum width and height. Click the **"Apply"** button to make these changes effective: this will also reset the **M2B** device and cause the video frame content to be re-drawn – therefore clicking this button can also be used to rectify some erroneous video display problems. Note **Window Position** cannot be changed when **Video Window** is in **Full Screen** Mode.

- **Common Positions:** Select from some commonly used video window sizes and positions:



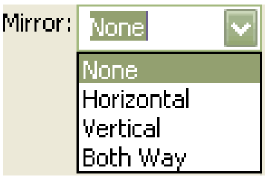
Note 1: For **Window Cropping**, PAL and NTSC have different default values:

For PAL: Left=15, Top=10, Width=720, Height=576: 720/576 are the max. pixels;
For NTSC: Left=15, Top=12, Width=720, Height=480: 720/480 are the max. pixels.

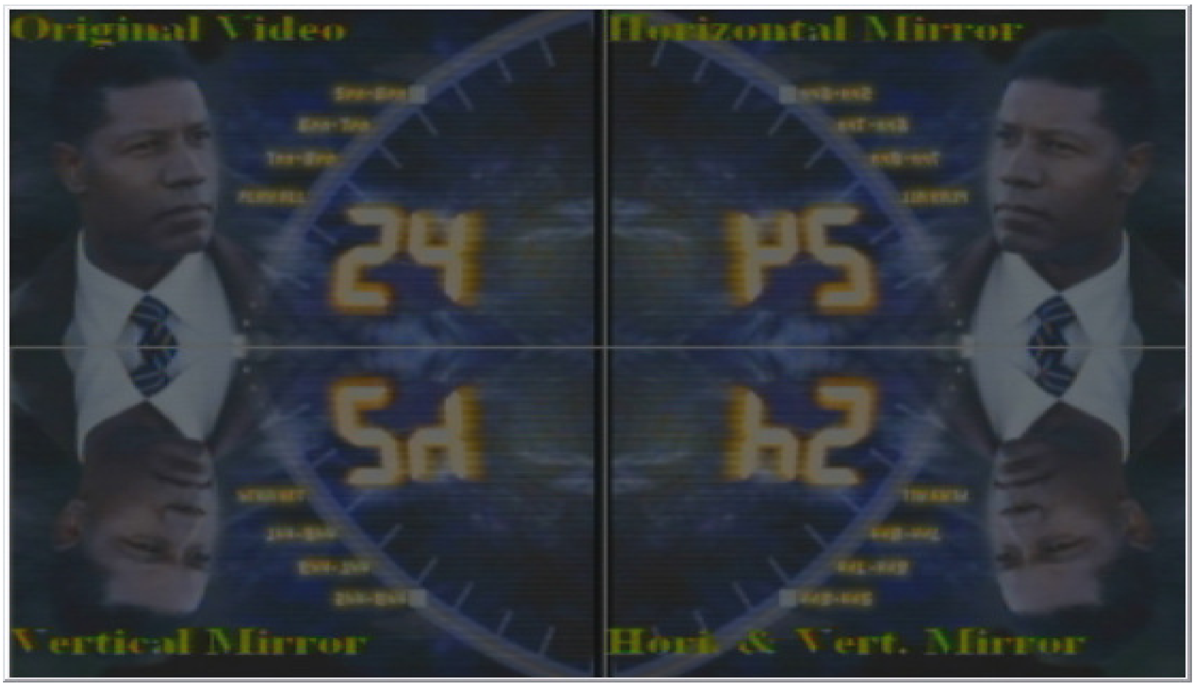
Note 2: The default "**4 Channels**" Common Position uses different values for PAL and NTSC:

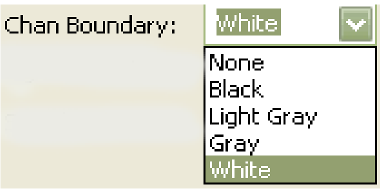
For PAL: Channel 1 Left=0, Top=0, Width=360, Height=288
Channel 2 Left=360, Top=0, Width=360, Height=288
Channel 3 Left=0, Top=288, Width=360, Height=288
Channel 4 Left=360, Top=288, Width=360, Height=288
For NTSC: Channel 1 Left=0, Top=0, Width=360, Height=240
Channel 2 Left=360, Top=0, Width=360, Height=240
Channel 3 Left=0, Top=240, Width=360, Height=240
Channel 4 Left=360, Top=240, Width=360, Height=240

Note 3: Selecting any common position will reset the **M2B** device and redraw video frame.
Note 4: Common Position cannot be selected when **Video Window** is in **Full Screen** Mode.


Mirror: None

- **Mirror:** Flip this channel's video content horizontally and/or vertically:




Chan Boundary: White

- **Chan Boundary:** Draw boundary around this channel's video window edges.

- **Brightness, Contrast, Hue, Saturation, Sharpness:** The value ranges of these features are different between video source Input1~Input4 and video source Input5, note the **U Saturation / V Saturation** mean U / V component saturation in a YUV colour space, and this is only applicable to Input1~Input4 video sources, Input5 video source only has **Saturation**.

- **Signal Standard, Signal Field Rate**: When a video channel has incoming signal, these are automatically detected and set. When a channel has no signal, the **Signal Field Rate** will indicate "**No Signal**".

ii. Common Features

- **Encoding Video Standard**: This field decides the video display & MPEG encoding video signal standard. Changing this value will cause a reset on the **M2B** device and a redraw on the video frame. On **USBOSDM2.exe** program's startup, this field will use the **USBOSDM2.ini** file's saved value when last time the program exit: if **USBOSDM2.ini** does not exist or is not being used (e.g. holding Ctrl key at program start up or command-line parameter **–d** is used --- see details in the "Command Line Parameters" Section), this field will use the signal standard of the first channel having signal, if no channel has signal, a dialog will appear asking user to select a value for this field. Note this field's value can be different from input channels' signal standard.

- **Auto Rectify Height**: When this is ticked (default), and some channels' signal is switching between PAL and NTSC, the software will try automatic adjustment of video channels' height according to standard PAL and NTSC values, as described previously under **Window Cropping, Window Position** and **Common Positions** sections – if this automatic adjustment still cannot fix some erroneous video display then try clicking the Window Position's "Apply" button.

- **PAL and NTSC TV Signal Standard**: Normally using same PAL or NTSC signal for all input video channels is recommended. However, **USBOSDM2** can accept mixed PAL and NTSC signals among its input channels: in this case manually adjusting some channels' window cropping & position will usually be needed to guarantee all channels are displayed properly. When input signal changed between PAL and NTSC, make sure each channel's **Window Cropping** and **Position** are set to PAL or NTSC required values as described previously.

- **M2B Setup**: This is the same as the "**Encoding Properties**" button on the "**Record Setup**" Window, see the "**Record Setup**" section later in this manual for details.

b. Audio Channel Setup

Each **USBOSDM2** device has 4 simultaneously available stereo audio input channels (i.e., each channel contains left and right sub-channels): audio signals coming from these channels are mixed and digitized into one digital stereo audio stream by the **OSD** device. Audio Channel 1 and 2 can select signal source from either their corresponding stereo Line-in sockets or stereo Microphone sockets, while Audio Channel 3 and 4 can only receive signal from their corresponding stereo Line-in sockets:
Audio channel 1 signal source: Stereo Line-in socket 1 or Stereo Mic. socket 1
Audio channel 2 signal source: Stereo Line-in socket 2 or Stereo Mic. socket 2
Audio channel 3 signal source: Stereo Line-in socket 3
Audio channel 4 signal source: Stereo Line-in socket 4

The **Mute** function has different meanings between audio channels 1 ~ 3 and audio channel 4: audio channel 4 allows its left and right sub-channels to be individually muted/un-muted, while audio channel 1 ~ 3 must mute or un-mute their left and right sub-channels simultaneously.

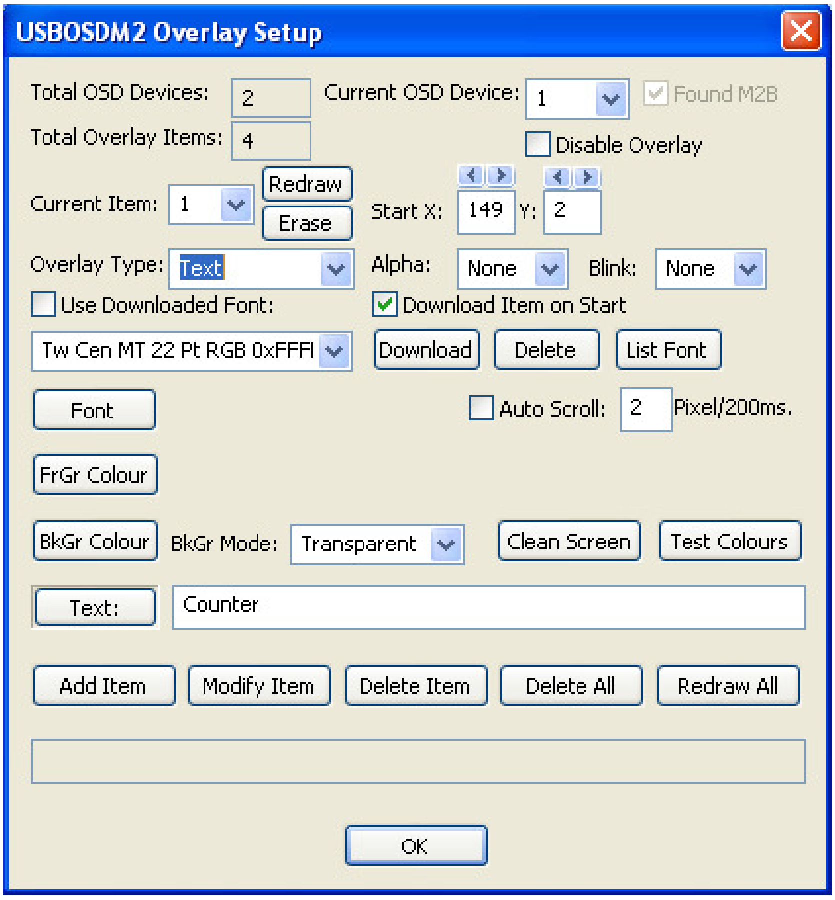
Audio Gain controls each audio input channel's signal strength: this will be reflected in the recorded / streamed MPEG video stream as well as in the PC's speaker output.

The **Volume** and **Balance** controls inside the **PC Speaker Audio** group affect only PC Speaker output, audio in the compressed MPEG stream will not be affected by these changes.

9. Overlay Setup

a. Overlay Item, Type and Colour

The **Overlay Setup** window controls how text and graphics items (Overlay Items) are overlaid on the surface of the video frame, regardless if video signal is available at any video input channel. This window can be brought up from the **Control Window**’s **Setup->Overlay Setup** menu item, or from the **Drop-down Menu-> Overlay Setup**:



USBOSDM2 Overlay Setup

Total OSD Devices: 2 Current OSD Device: 1 ☑ Found M2B

Total Overlay Items: 4 □ Disable Overlay

Current Item: 1 Redraw Erase Start X: 149 Y: 2

Overlay Type: Text Alpha: None Blink: None

□ Use Downloaded Font: ☑ Download Item on Start

Tw Cen MT 22 Pt RGB 0xFFFI Download Delete List Font

Font □ Auto Scroll: 2 Pixel/200ms.

FrGr Colour

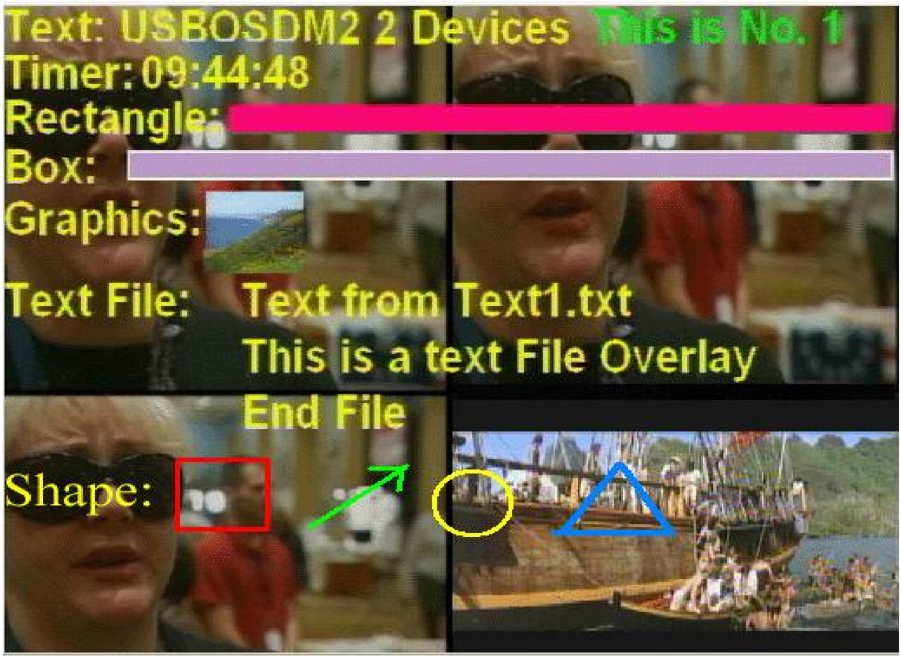
BkGr Colour BkGr Mode: Transparent Clean Screen Test Colours

Text: Counter

Add Item Modify Item Delete Item Delete All Redraw All

OK

Overlay on video frame is realized by creating **Overlay Items**: each item has an **Overlay Type.** Current **Overlay Types** are **Text, Text File, Timer, Rectangle, Box, Graphics File** and **Shape**:


Text: USBOSDM2 2 Devices This is No. 1
Timer: 09:44:48
Rectangle:
Box:
Graphics:
Text File: Text from Text1.txt
This is a text File Overlay
End File
Shape:

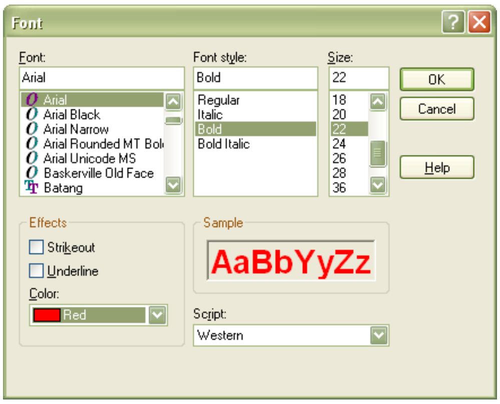
.

Every overlay item is associated with some options such as font, colour, alpha, blinking, etc. Overlay Items can be added, modified, deleted and redrawn. To create a new overlay item, first select an **Overlay Type**, fill in relevant options such as **Start X/Y** position, **Font**, **Text** etc., then click the **Add Item** button, the overlay item will appear on the video frame and output TV monitor. If recording is in progress, overlay will also be recorded into MPEG video file immediately.
Note 1: When drawing overlay item onto video frame, pressing **Esc** key can abort the operation: aborting overlay painting requires hardware reset on OSD and M2B devices so do this with caution.
Note 2: Avoid extending an overlay item's ending edges beyond video frame's limits (720/576/480).

Most overlay items use colours --- foreground colour or background colour or both. At any given time, **USBOSDM2** hardware allows 251 different colours to be used simultaneously on the video frame: these 251 colours can be selected out of the 16-Million or so possible colour combinations (256 Red, 256 Green and 256 Blue). The currently selected 251 colours form a "Colour Palette" or "Colour Lookup Table". When first started, **USBOSDM2** uses a default Colour Palette: this can be viewed by clicking the "**Test Colours**" button. Colour Palette can be changed when Graphics File Overlay Item is used: see more details in the **Graphics File Overlay** section.

b. Text Overlay

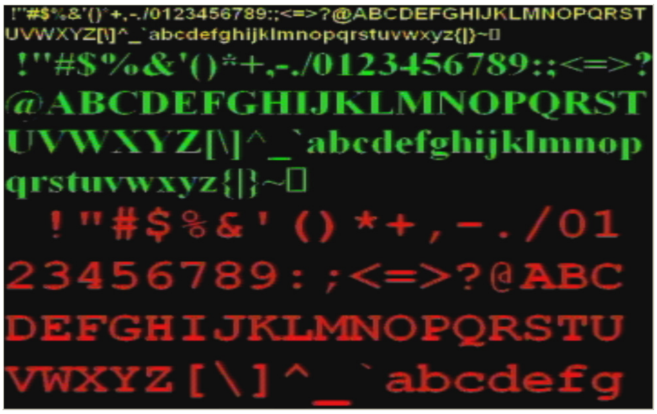
To use **Text Overlay** item, the edit field next to the "**Text:**" must have text. The text's type face, size, style, colour etc. can be selected in the **Font** window after clicking the "**Font**" button:



Font: Arial
Font style: Bold
Size: 22
Color: Red
Script: Western

The "**Font**" used by **Text** overlay can be either non-downloaded (this is default, when check box "**Use Downloaded Font**" is cleared), or "**Downloaded**" ("**Use Downloaded Font**" box is ticked): **non-downloaded** means when each character used in a text overlay is being painted onto video frame, its bitmap is downloaded to **USBOSDM2** device at that time; **downloaded** means first downloading all characters' bitmaps of the current font onto **USBOSDM2** device, then using each character's downloaded bitmap to paint the text overlay onto the video frame(without downloading the characters' bitmaps again). The main advantage of using downloaded font is to display the text overlay quickly, although the one time downloading of the entire font's bitmaps will usually take much longer time. **Downloaded font** also cannot have **Opaque** background mode nor the Alpha/Blinking options (see below). Note each time the **OSD** device is hardware reset, or the **USBOSDM2** program is re-started, all downloaded fonts will need to be re-downloaded.

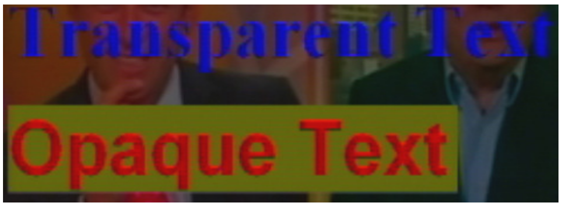
USBOSDM2 allows four 720X576-Pixel memory pages to hold all downloaded fonts: clicking the "**List Font**" button will show currently downloaded font bitmaps, e.g. 3 fonts are listed like this:



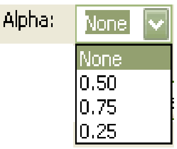
Each downloaded font has bitmap images for characters with ASCII values 0x20 ~ 0x7F (printable characters), therefore only these characters can be used with downloadable fonts.

The text colour can also be selected from the **Foreground Colour** window by clicking the "**FrGr Colour**" button: this allows much more possible colour selections than the "**Color**" combo selection inside the **Font** selection window --- however, if a colour selected in the **Foreground Colour** window is not among the limited number of possible colours inside the **Font** window's **Color** combo box, the **Font** window will always display black colour.

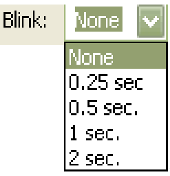
The **Text** overlay has a **Background Mode (**BkGr Mode) option: this can be either **Transparent** (default) or **Opaque**. If **Transparent** is selected, the spaces in between a character's strokes will expose the background video content. If **Opaque** is selected, these spaces will be filled with the **Background Colour** (BkGr Colour), as seen here: .



The **Alpha** option allows less than fully visible text to be painted on video frame: smaller alpha value means less visibility, default is no alpha(full visibility).



The **Blink** option enables the text to blink at certain frequency: , default is no blinking.



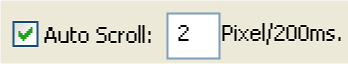
Note text using **Downloaded** font cannot have **Opaque** background, nor **Alpha** or **Blinking** option.

c. Text File Overlay

Text File Overlay is the same as **Text Overlay** except that **Downloaded Font** must be used and characters displayed are from a user-selected ASCII text file with Carriage-Return + Line-Feed terminating each line. Using the selected Downloaded Font, if a line's text image has horizontal length or vertical height beyond the video frame edges, that will be treated as an error and that text line will not be displayed. Also if no **Downloaded Font** is selected error will appear.

d. Auto Scroll Text or Text File Overlay

When **Downloaded Font** is available, **Text** or **Text File** overlay item can select the "**Auto Scroll**" option to automatically scroll text content across the video frame continuously from right to left:

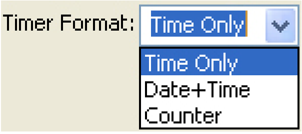


☑ Auto Scroll: 2 Pixel/200ms.

. The Auto Scroll's left-most position is defined by the **Start X:** and **Y:** values, and the right-most (start) scroll position is always at the video frame's right edge. When Text item is used, its text string will be repeatedly used to scroll right-to-left. When Text File overlay item is used, its file contents will be sequentially used line-by-line as the scrolling text.

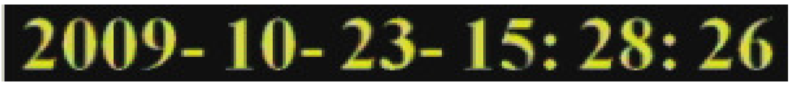
e. Timer Overlay

Timer is a special case of **Text** overlay: it displays current time or counter text on video frame in some interval. **Timer** overlay also has no **Blink** option (cannot blink). The **Timer Format**



Timer Format: Time Only

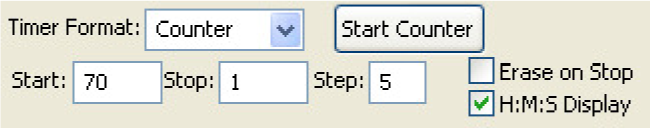
option allows selecting **time only**, **date+time** or **counter** to be displayed:



2009- 10- 23- 15: 28: 26

.

While using either the "**Time Only**" or "**Date+Time**" will advance the time display every second, using the "**Counter**" format will allow a variable display interval and need to fill extra options:



Timer Format: Counter

Start: 70 Stop: 1 Step: 5

☐ Erase on Stop
☑ H:M:S Display

.

- **Start:** Counter's start counting value, must be either bigger or smaller than the "**Stop**" value.
- **Stop:** Counter's stop counting value. If **Start > Stop**, the counter forms a **Countdown Timer**.
- **Step:** the Counter's update time interval in 200 ms (0.2 second) unit: every value 5 is 1 second.
- **"Start Counter":** Click this button will start the counting and change the text to "**Stop Counter**".
- **"Erase on Stop":** If this is cleared (default), the counter's last value will remain visible when the counter stops (as a result of counting to the "**Stop**" value or user manually clicking the "**Stop Counter**" button). Ticking this will make the last counted value to disappear when counter stops.
- **"H:M:S Display"**: If selected, counter display will use Hour:Min.:Sec. format, default is no. If this is selected, "**Step**" will always be multiple of 5 so that counter changes at 1 sec. interval.

For example, on clicking the "**Start Counter**" button, a counter timer with the displayed options in the previous screen shot will start counting down from 70 second displayed as 00:01:10, decreasing value 1 every second until the counter reaches 1 second displayed as 00:00:01, which will remain on video frame. This counter's entire counting process will last 69 seconds.

When Counter Timer Overlay Item is defined for a **USBOSDM2** device, its **Drop-down Menu** will have an item "**Start Counter (Ctrl+C)**": selecting this item or pressing Ctrl+C keys will start the counter and change the menu item text into "**Stop Counter (Ctrl+C)**", selecting the menu item or pressing Ctrl+C again will stop the counting.

Timer overlay is a typical example of using "Downloaded Font" text overlay: each time a new **Timer** overlay is created, all 12 possible characters' bitmaps are first downloaded onto

USBOSDM2 device's on-board memory, periodical timer/counter update happens after this downloading finishes, this way an instant change of text is accomplished per timer interval.

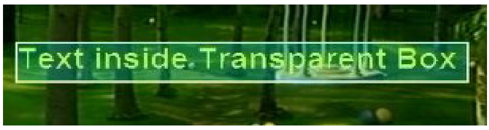
Only one **Timer** overlay item is allowed for each **USBOSDM2** device.

f. Rectangle Overlay

Rectangle overlay allows drawing coloured rectangles on video frame: minimum width (the **W:**) and height (the **H:**) are 2 pixels. Rectangle drawn is filled with foreground colour, but has no background mode nor background colour.

g. Box Overlay

Box overlay is a special overlay type that has several features different from the **Rectangle** overlay:

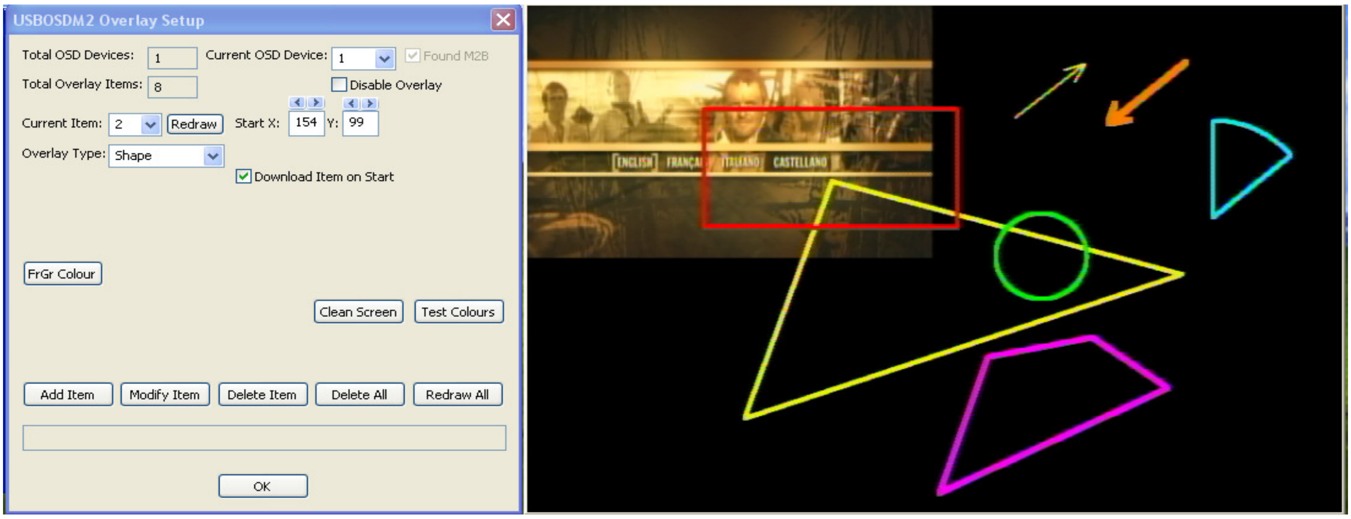
- Only 4 **Box** overlay items are available for each **USBOSDM2** device.
- No **Blink** option for **Box** overlay.
- **Box** overlay can have white **Boundary.**
- Apart from the foreground colour, **Box** overlay can also use some pre-defined "Box Colour" which will not be affected by the colour palette currently in use.
- **Box** and **Text** overlays can be overlapped to form "Text with partially transparent background" effect, such as this: .
- When **Box** overlay item is overlapped with other overlay items, **Box** overlay is always on top.

h. Graphics File Overlay

Graphics File overlay allows BITMAP, JPEG, GIF etc files to be overlaid on the video frame. Files used must have 256-colour palette, byte-aligned in width, and be DIB section --- normal graphics editing programs such as Microsoft Paint and Adobe PhotoShop etc. can create these graphics files. When a graphics file is loaded as overlay, its **Palette** can be optionally loaded to replace the default Palette (by ticking the **Use Palette** check box) ---- although doing so might improve the overlaid graphics quality, it will also affect the colours used to draw other type of overlay items, such as text or timer. Therefore when using **Graphics File** overlay with "**Use Palette**" ticked, it's better to create it before creating other overlay items such as text or timer. **Graphics File** overlay cannot **Blink**.

i. Shape Overlay

Shape overlay is built from defining discreet dots on the video frame: various geometric shapes can then be created from these discreet dots, inc. arc/circle, arrow, rectangle, line and polygon:

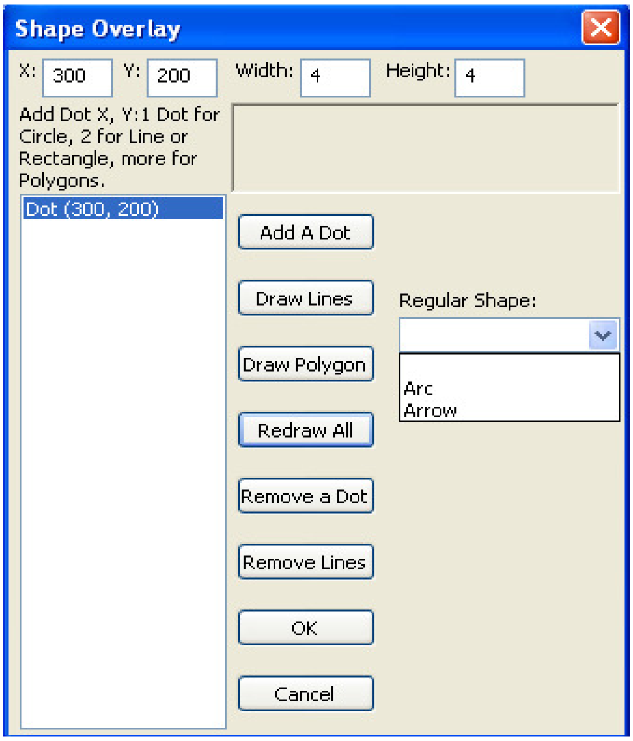


USBOSDM2 Overlay Setup

Total OSD Devices: 1
Current OSD Device: 1
☑ Found M2B
Total Overlay Items: 8
□ Disable Overlay
Current Item: 2
Start X: 154 Y: 99
Overlay Type: Shape
☑ Download Item on Start

In addition to the dot location on video frame, each **Shape** overlay item also can define its colour, pixel width and height, and "**Regular Shape**" type: line, polygon, arrow, arc, rectangle, etc.

To create a **Shape** overlay item, select the "**Shape**" overlay type on the "**Overlay Setup**" Window, then click the "**Add Item**" button to display the "**Shape Overlay**" Window:



Shape Overlay

X: 300 Y: 200 Width: 4 Height: 4

Add Dot X, Y:1 Dot for Circle, 2 for Line or Rectangle, more for Polygons.

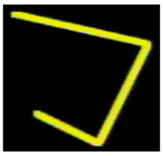
Dot (300, 200)

Regular Shape:

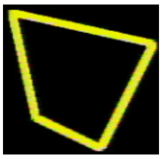
Initially at least one dot need to be defined and added to form a **Shape**. The actual **Type of Shape** depends on the number of dots, how the lines are drawn and the "**Regular Shape**" type selected:

- **Discreet Dots**: This is the default once dots are added into the left side list box: they are drawn but not linked.

- **Lines**: When more than one dots are defined and "**Draw Lines**" button clicked, straight lines are drawn between adjacent dots, e.g. a 4-Dot Lines may look like this:



- **Polygons**: When more than two dots are defined and "**Draw Polygon**" button clicked, straight lines are drawn between adjacent dots and a final line is drawn between the first and last dots thus forming a closed polygon, e.g. a 4-Dot Polygon may look like this:



- **Arc**: One dot can be defined as the centre point of an **Arc** which can be selected from the combo-box below the text "**Regular Shape:**". An **Arc** also needs to define other parameters:

-- **Radius**: the distance in pixels from the centre point to any point on the arc.

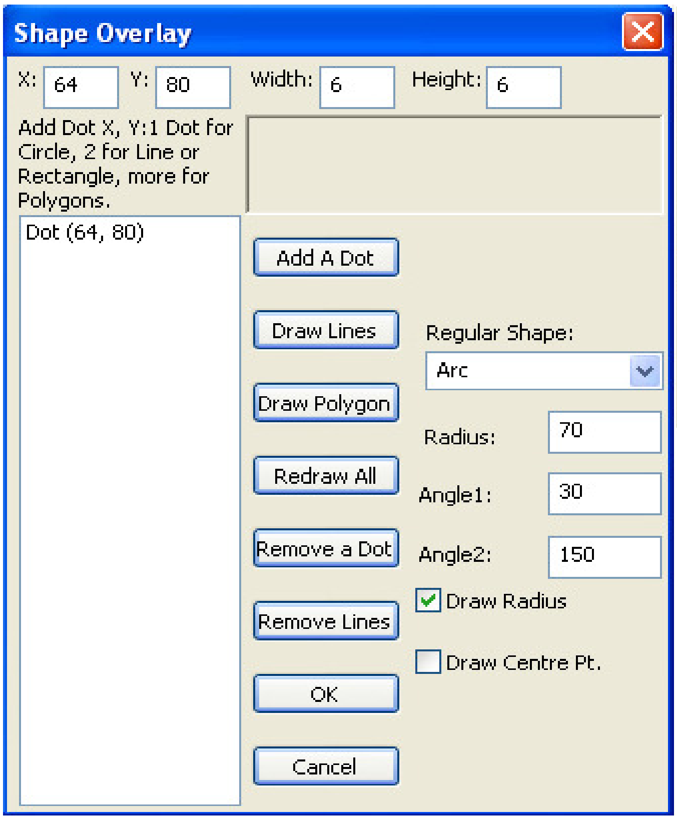
-- **Angle1**: the starting angle of the arc. All angles are defined counter-clockwise: 0° is east (left-to-right), 90° is north (lower-to-upper), 180° is west (right-to-left), 270° is south (upper-to-lower). Angles >= 360° are modulus to 360°, e.g. 400° is treated as 40°.

-- **Angle2**: the ending angle of the arc, degree is defined the same way as Angle1. A **Circle** is formed when (Angle2 – Angle1) Modular 360° = 0°.

-- **Draw Radius**: ticking this box will draw lines between the centre point and the two points on the arc where the **Radius** indicates the Angle1 and Angle2.

-- **Draw Centre Pt**: ticking this box will draw the centre point dot.

e.g. defining an **Arc** centred at (64, 80) with Angle1=30°, Angle2=150°, Radius=70-Pixel:



Shape Overlay

X: 64 Y: 80 Width: 6 Height: 6

Add Dot X, Y:1 Dot for Circle, 2 for Line or Rectangle, more for Polygons.

Dot (64, 80)

Regular Shape: Arc

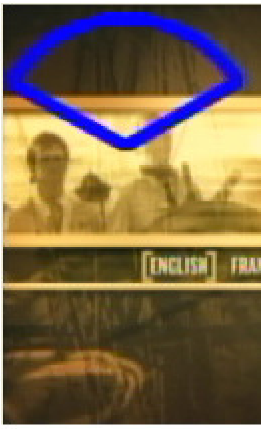
Radius: 70

Angle1: 30

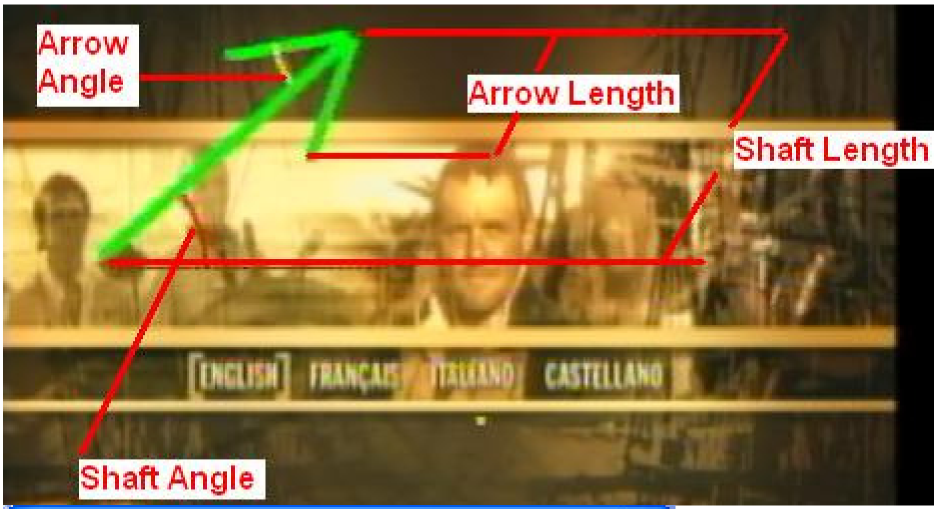
Angle2: 150

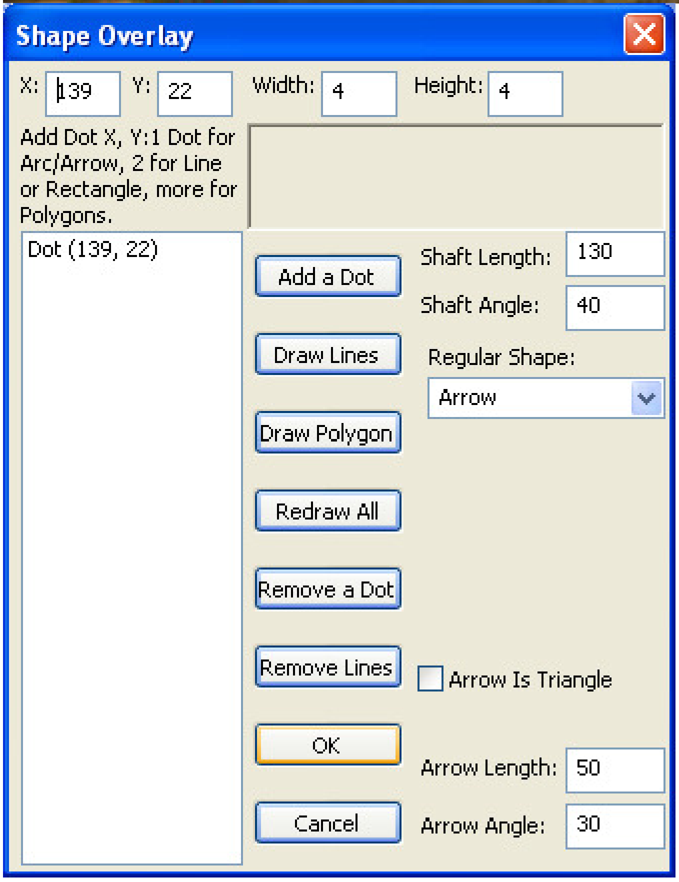
☑ Draw Radius

□ Draw Centre Pt.



- **Arrow**: One dot can also define the end point of an **Arrow** which can be selected from the combo-box below the text “**Regular Shape:**”. An **Arrow** also needs to define other parameters:





X: 139 Y: 22 Width: 4 Height: 4

Add Dot X, Y:1 Dot for Arc/Arrow, 2 for Line or Rectangle, more for Polygons.

Dot (139, 22)

Shaft Length: 130

Shaft Angle: 40

Regular Shape: Arrow

□ Arrow Is Triangle

Arrow Length: 50

Arrow Angle: 30

-- **Shaft Length**: distance from the Arrow’s pointed end to the end of the shaft.

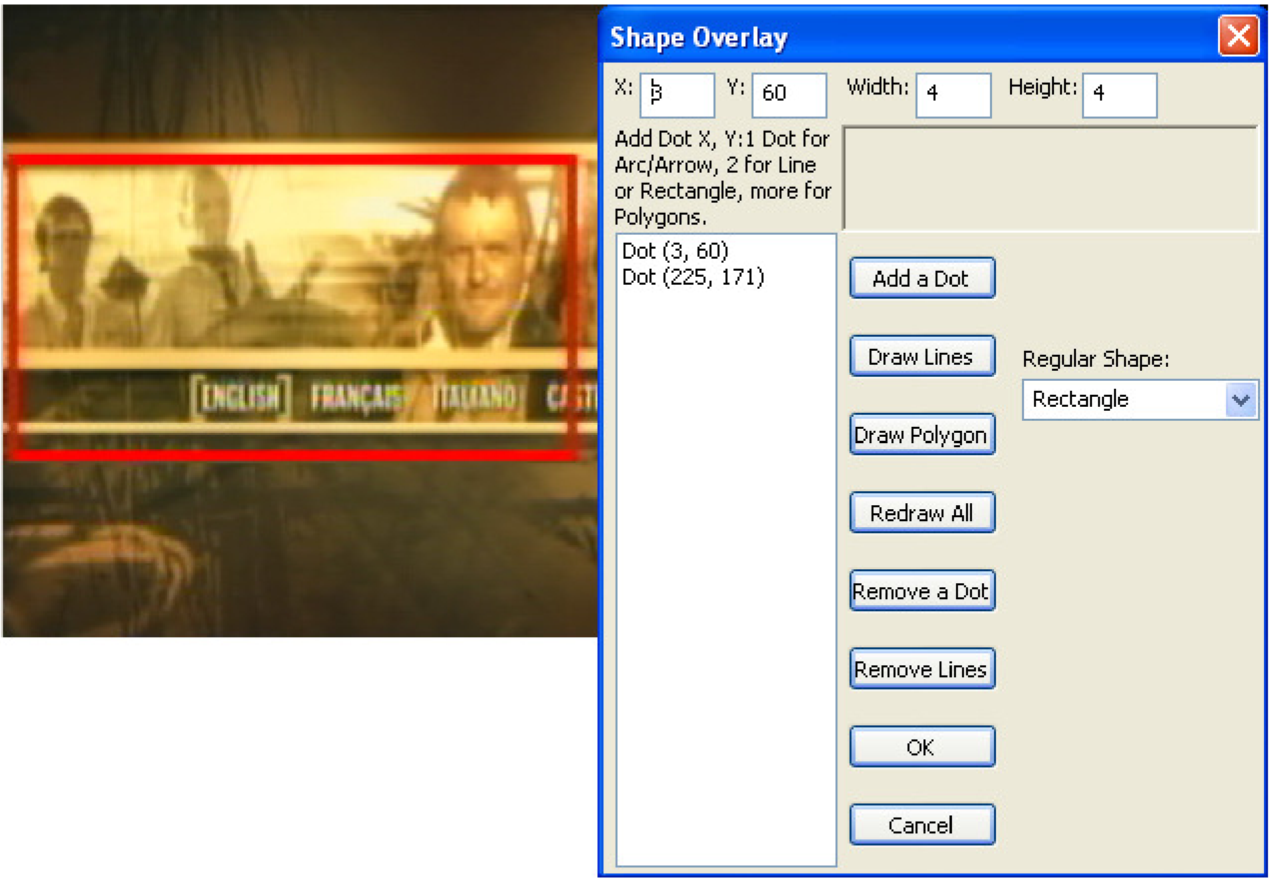
-- **Shaft Angle**: angle of the shaft line, 0° is east, same as angles defined in **Arc** overlay.

-- **Arrow Length**: distance from the Arrow’s pointed end to the end of each arrow line,
Arrow Length must be <= half of the Shaft Length.

-- **Arrow Angle**: angle between the shaft line and each of the arrow lines, from 1° to 89°.

-- **Arrow Is Triangle**: ticking this will draw a line between the ends of the two arrow lines.

- **Rectangle**: When two dots are added, **Rectangle** can be selected from the “Regular Shape” combo-box, in this case the two dots will serve as the two diagonal points of the rectangle:



X: 3 Y: 60 Width: 4 Height: 4

Add Dot X, Y:1 Dot for Arc/Arrow, 2 for Line or Rectangle, more for Polygons.

Dot (3, 60)
Dot (225, 171)

Regular Shape: Rectangle

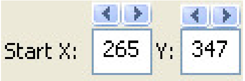
The function buttons on the **Shape Overlay Window:**

- **Add a Dot:** adding a dot to the **Shape** overlay using X/Y values defined in their Edit Boxes.
- **Draw Lines:** draw lines between adjacent dots.
- **Draw Polygon: same as Draw Line**s but also draw a line between the 1st and last dots.
- **Redraw All**: redraw the current **Shape** using possible new **Width** and **Height** values.
- **Remove a Dot:** delete a selected Dot in the list box then re-draw the lines if there were lines.
- **Remove Lines:** remove lines between dots if there are lines.
- **OK:** exit this Window, creating a new **Shape** overlay, or modifying/redrawing an existing one.
- **Cancel**: abandon the new **Shape** overlay if it was being created. If the **Shape Overlay** Window was opened when user clicked the "**Modify Item**" button on the **Overlay Setup** Window then this button will keep the modified/redrawn Shape and exit the **Shape Overlay** Window.

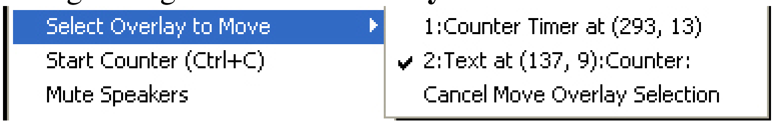
Note apart from dot location, pixel width/height and Regular Shape Type, **Shape Overlay** only has **Foreground Colour** option. Other options such as alpha, blink etc. are not used for **Shape** Overlay.

j. Move Overlay Item on Video Frame

Once an Overlay Item is created and displayed on Video Frame, it can be moved along horizontal and vertical directions quickly without modifying other parameters. Clicking the two Scroll Bars above the "Start X" / "Start Y" Edit Box will move the current Overlay Item one pixel per click along X or Y direction. A more convenient movement is through using the "**Select Overlay to Move**" menu item in the **Drop-down Menu**:



Start X: 265 Y: 347


Select Overlay to Move
Start Counter (Ctrl+C)
Mute Speakers
1:Counter Timer at (293, 13)
✓ 2:Text at (137, 9):Counter:
Cancel Move Overlay Selection

This menu item selection only appears when overlay items have been created for a **USBOSDM2** device and the "Disable Overlay" box was not ticked on the "**Overlay Setup**" Window. Selecting any one Overlay Item (only displayed Overlay Items are enabled to be selectable), then clicking Left Mouse Button while holding the **Shift** key will move the selected Overlay Item to the mouse-pointed location on the Video Frame. Note this movement is a simple copying of the rectangular area on the Video Frame where the selected Overlay Item situates, so if in the rectangular area there are other Overlay Items overlapping with the selected Overlay Item the overlapped pixels will also be copied to the new location. Also note any Overlay Item cannot be moved beyond the Video Frame's edges on each **USBOSDM2** device.

k. Overlay Item Options

- **Current Item**: Number of the current overlay item whose options are displayed on screen. Changing this will change other option values accordingly to reflect newly selected overlay item.
- **Overlay Type**: Select a type here before creating new overlay item. When **Current Item** value changes, this field reflects the current item's overlay type.
- **Disable Overlay:** Disable/Enable all overlay items on video frame.
- **Use Downloaded Font**: The current overlay item's text will use downloaded font.
- **Download Item on Start**: Overlay items with this box ticked will be automatically re-drawn when **USBOSDM2** program is started: this will take long time if too many items are defined.
- **Download**: Download the current font to **OSD** device: big font can take long time to download.
- **Delete**: Delete the current downloaded font.
- **List Font**: List all fonts already downloaded onto the RAM of **OSD** device.
- **Clear Screen**: Erase all overlay contents from the video frame without deleting the overlay items. After a **Clear Screen** operation, any existing overlay item can be re-displayed by clicking the "**Redraw"** or the "**Redraw All**" button.
- **Test Colours**: List all colours of the current Palette (Colour Lookup Table) used.
- **Add Item**: Create a new **Overlay Item.**
- **Modify Item**: Modify the current overlay item using the various new option values on the screen.
- **Delete Item**: Delete the current overlay item.
- **Delete All**: Delete all overlay items.
- **Redraw All**: Redraw all existing overlay items.
- **Redraw**: Redraw current overlay item using its existing option values (ignore on-screen options).
- **Erase**: Erase the current overlay item from video frame but will not delete it (it can still Redraw).
- **FrGr Colour**: Set Foreground (pixels') Colour for Text, Timer, Box, Rectangle Overlay Items.
- **BkGr Colour**: Set Background Colour for Text/Timer/Graphics File Overlay. If "Transprent" is used for "**Bkgr Mode**", pixels on overlay item with this colour will become transparent (video behind these pixels become visible): similar as the "Blue Screen" effect in video editing process.
- **Bkgr Mode**: Set Background Mode (Transparent/Opaque) for Text/Timer/Graphics File Overlay.
- **Timer Format**: Select to display Time Only, Date+Time or Counter for Timer Overlay Item.
- **Text**: The text content for Text Overlay Item.
- **File**: Load a file for Text File or Graphics File Overlay (large graphics can be time-consuming).
- **Alpha**: The visibility of the current overlay item: lower alpha value means less visible. Note each **USBOSDM2 device** can only have one Alpha value at a time: if one Overlay Item defines a new Alpha value (either 0.25, 0.5, or 0.75) then all overlay items having Alpha values defined

previously will be using the same Alpha value (overlay items having None as their Alpha values will not be affected).

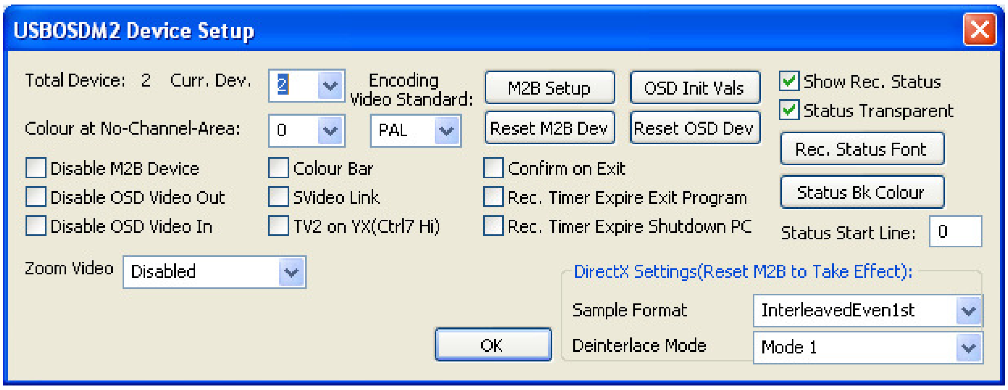
- **Blink**: Blinking time interval of the current overlay item. Note each **USBOSDM2 device** can only have one Blink time interval at a time: if one Overlay Item defines a new Blink time (either 0.25, 0.5, 1 or 2 seconds) then all overlay items having Blink defined previously will be using the same Blink time (overlay items having None as their Blink values will not be affected).
- **Start X, Start Y**: For most Overlay Item Types, these indicate the Upper left corner of the current overlay item on Video Frame. If the current Overlay Item Type is **Shape** with "**Regular Shape**"== **Arc** (inc. Full Circle), this X/Y will indicate the centre point dot of the **Arc** on the Video Frame. If the current Overlay Item Type is **Shape** with "**Regular Shape**"== **Arrow**, this X/Y will indicate the arrow-pointed dot location on the Video Frame.
- **W, H**: The Width and Height of the Rectangle or Box Overlay Item, resolution is 2-pixels.
- **Boundary**: Enable boundary for Box Overlay Item.
- **Box Colour**: Select pre-defined colour as the filling colour for Box Overlay Item.

l. Overlay Items Overlap Priority

When two or more Overlay Items' contents are overlapped on video frame, the more recently drawn items are always on top of the previously drawn items' contents, with the exception of the **Box** Overlay which is always on top of the non-**Box** overlay items' content.

10. Device Setup

The **Device Setup** window controls functions affecting the entire **USBOSDM2** device's operation. This window can be brought up either from the **Control Window**'s **Setup->Device Setup** menu item, or from the **Drop-down Menu-> Device Setup**:



USBOSDM2 Device Setup

Total Device: 2 Curr. Dev. 2

Encoding Video Standard: PAL

Colour at No-Channel-Area: 0

☑ Show Rec. Status

☑ Status Transparent

□ Disable M2B Device

□ Disable OSD Video Out

□ Disable OSD Video In

□ Colour Bar

□ SVideo Link

□ TV2 on YX(Ctrl7 Hi)

□ Confirm on Exit

□ Rec. Timer Expire Exit Program

□ Rec. Timer Expire Shutdown PC

Status Start Line: 0

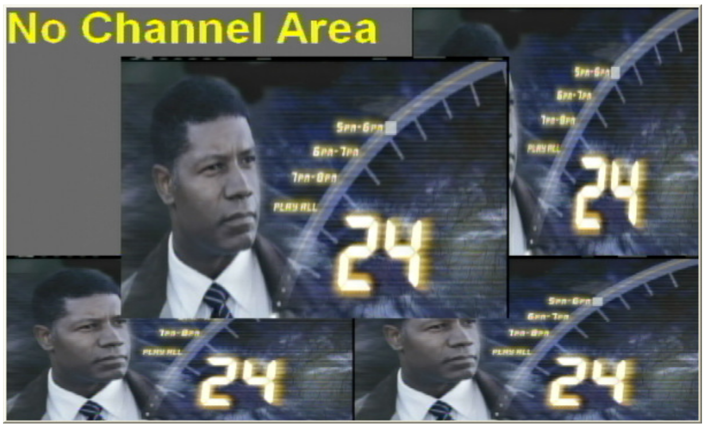
Zoom Video: Disabled

DirectX Settings(Reset M2B to Take Effect):

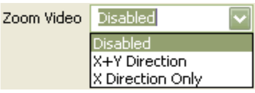
Sample Format: InterleavedEven1st

Deinterlace Mode: Mode 1

- **Colour at No-Channel-Area**: Select the colour used to paint the areas inside this **OSD** Device's video frame that are not occupied by any video channel, default is grey colour:



- **Encoding Video Standard**: Set video display & MPEG encoding signal standard, details are described in the "**Video Channel Setup/Common Features**" Section under the same title.
- **Disable M2B Device**: Disable the **M2B** device, resulting in a freeze of **OSD** Device's video content: this will take some time to finish and will revert to No when leaving this device's setup.
- **Disable OSD Video Out**: Stop video signal leaving the **OSD** device, resulting in total black out of this **OSD** Device's video content.
- **Disable OSD Video In**: Stop video signal input to **OSD** device at all of the four video channels.

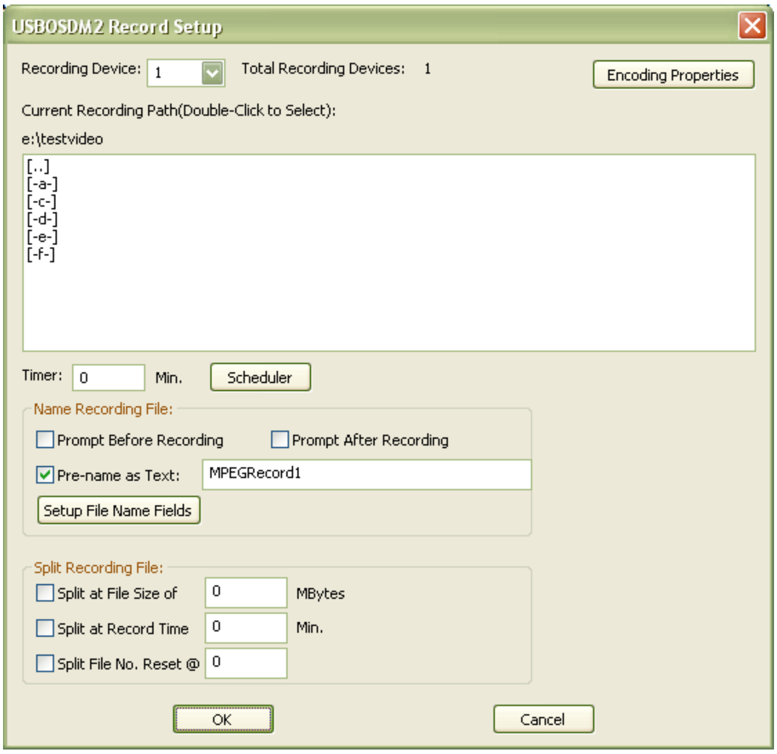


- **Zoom Video**: When enabled, left-mouse clicking inside this **OSD** Device's video frame while holding down the **Ctrl** key will enlarge (**Zoom**) the video content by 2 times from the clicked pixel along the vertical (Y) and / or the horizontal (X) direction. To cancel the **Zoomed** mode, left-mouse click anywhere in this **OSD** Device's video frame without holding down the **Ctrl** key. **Zoom Video** will not work when **Video Window** is in full screen mode.
- **Colour Bar**: Display Colour Bar as this OSD Device's video content in front of any input signal.
- **SVideo Link**: Using SVideo or Composite Link between **OSD** and **M2B** devices. If SVideo is used, TV OUT 1 will connect to the SVideo's Y signal pin so will output black & white signal.
- **TV2 on YX**: If TV OUT 2 connects to the Y signal pin of the **OSD** device's SVideo output when **SVideo Link** is used (Default is TV OUT 2 connects to **OSD** device's Composite output).
- **Confirm on Exit**: If to display a confirmation dialog before exiting the **USBOSDM2** program.
- **Rec. Timer Expire Exit Program**: Exit **USBOSDM2** software when recording ends because timer expires: if any device is still recording or any dialog is still open the exit will not happen.
- **Rec**. **Timer Expire Shutdown PC**: Shutdown PC when recording ends because recording timer expires: if any device is still recording or any dialog is still open the shutdown will not happen.
- **M2B Setup**: Same as the "**Encoding Properties**" button on the "**Record Setup**" Window.
- **Reset M2B Device**: Hardware reset the **M2B** device: this will take some time to finish.
- **Reset OSD Device**: Hardware reset the **OSD** device: can correct errors like no video display etc.
- **OSD Init Vals**: Load an .ini file to **OSD** device: such as OSDValsPAL.ini, OSDValsNTSC.ini.
- **Show Rec. Status**: Display on-screen recording status when MPEG file recording is in progress.
- **Status Transparent**: The recording status is in transparent (exposing background video) mode.
- **Rec. Status Font**: Define recording status text font: adjust this to make status line fully visible.
- **Status Bk Colour**: Change recording status' background colour if it's not in transparent mode.
- **Status Start Line**: The 1st row of the status pixels: max. is approx. 570 (PAL) or 470(NTSC).
- **DirectX Settings:** Windows' Video Rendering options, need a **Reset M2B** after changing these:
  --- **Sample Format**: Method used by the **M2B** device to sample video frames.
  --- **Deinterlace Mode**: Method used by the **M2B** device to de-interlace video.

11. Recording Video

a. Setup Recording

Record Setup Window controls how MPEG files are recorded; it can be brought up from either **Control Window->Setup->Record Setup** menu item, or **Drop-down Menu-> Record Setup:**



USBOSDM2 Record Setup

Recording Device: 1 Total Recording Devices: 1 Encoding Properties

Current Recording Path(Double-Click to Select):

e:\testvideo

[..]
[-a-]
[-c-]
[-d-]
[-e-]
[-f-]

Timer: 0 Min. Scheduler

Name Recording File:

□ Prompt Before Recording □ Prompt After Recording

☑ Pre-name as Text: MPEGRecord1

Setup File Name Fields

Split Recording File:

□ Split at File Size of 0 MBytes

□ Split at Record Time 0 Min.

□ Split File No. Reset @ 0

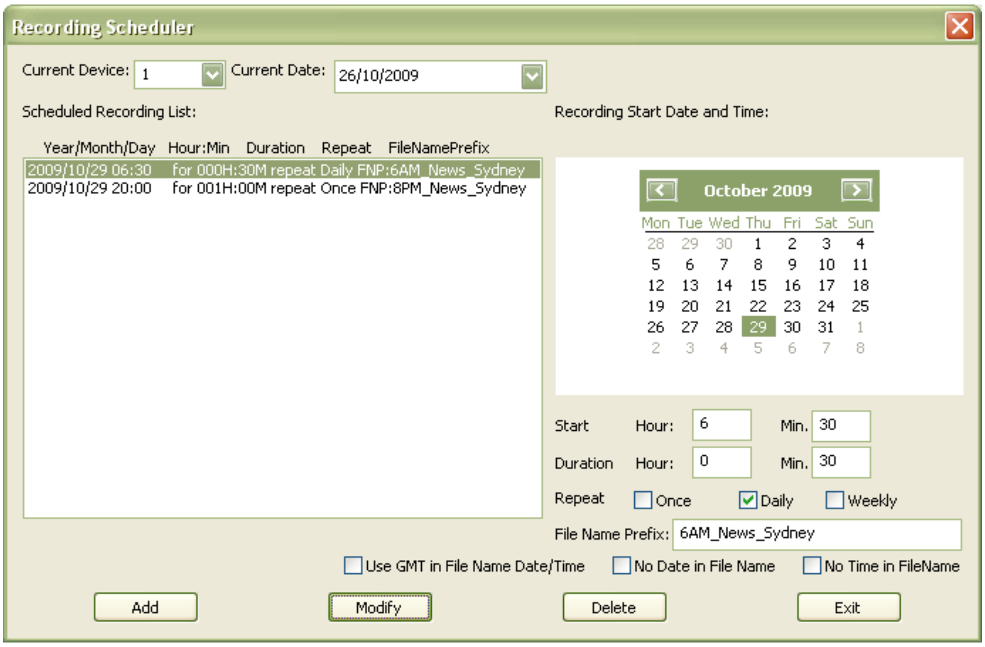
OK Cancel

- **Recording Device**: Select device number when multiple **USBOSDM2** devices are connected.

- **Current Recording Path**: The folder for recorded files, double clicking a disk or folder name in the list-box will show sub-folders under it, currently selected folder is above the list-box.

- **Timer**: If recoding timer is set in minute unit, recording will stop at that time length. Zero (default) timer value means no timer: record can only be stopped by user manually or when disk is full.

- **Scheduler**: Starts **Recording Scheduler** window to schedule recordings in future time:



Recording Scheduler

Current Device: 1 Current Date: 26/10/2009

Scheduled Recording List:

```
  Year/Month/Day  Hour:Min  Duration  Repeat  FileNamePrefix
2009/10/29 06:30   for 000H:30M repeat Daily FNP:6AM_News_Sydney
2009/10/29 20:00   for 001H:00M repeat Once FNP:8PM_News_Sydney
```

Recording Start Date and Time:

October 2009

Mon	Tue	Wed	Thu	Fri	Sat	Sun
28	29	30	1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	1
2	3	4	5	6	7	8

Start Hour: 6 Min. 30

Duration Hour: 0 Min. 30

Repeat □ Once ☑ Daily □ Weekly

File Name Prefix: 6AM_News_Sydney

□ Use GMT in File Name Date/Time □ No Date in File Name □ No Time in FileName

Add Modify Delete Exit

Start Hour is in 0~24 hour format, e.g. 7:30PM is expressed as Hour: 19 Min. 30.

Repeat indicates how a scheduled recording will repeat: once only or daily or weekly.

File Name Prefix (FNP) is used as the first part of the scheduled recording file name, the scheduled recording file name is usually formed as: **FNPDateTime**.mpg, where **FNP** must not contain space character and is maximum 20 bytes. Note scheduled recording file names will not follow the methods described in the **"Name Recording File**" section below.

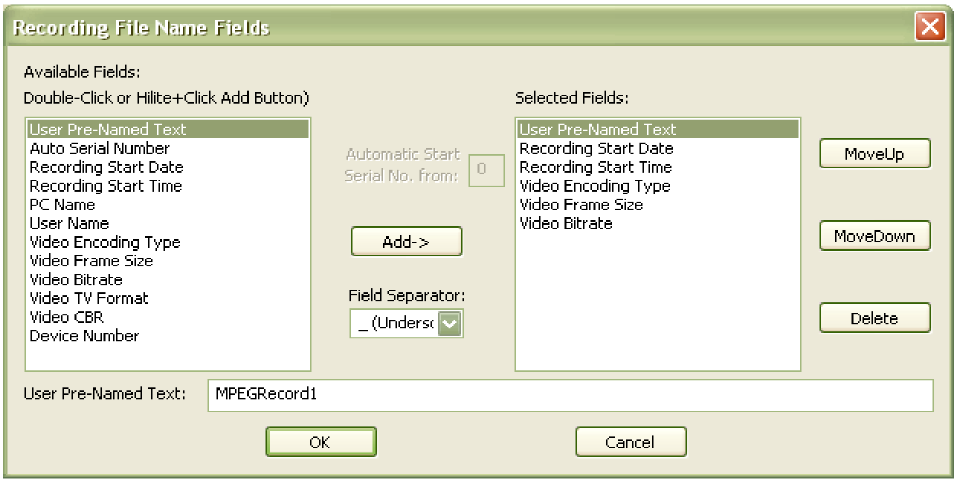
Use GMT in File Name/Date/Time: if ticked, the date/time is according to Greenwich Mean Time (or UTC -- Coordinated Universal Time), otherwise (default) local time is used.

No Date in File Name: if ticked, scheduled recording file name is formed as **FNPTime**.mpg.

No Time in File Name: if ticked, scheduled recording file name is formed as **FNPDate**.mpg.

The **Add, Modify, Delete** buttons are to add, modify and delete scheduled recording. Schedule a recording prior to current time will have no effect.

- **Name Recording File**: This decides how non-scheduled recording will form file names:
  Prompt Before Recording:
  Each time before recording starts a dialog will appear asking for file name.
  Prompt After Recording:
  Each time when recording stops a dialog will appear asking for file name.
  Pre-name as Text:
  Creating recording file name using "**File Name Fields**" as defined in the "**Recording File Name Fields**" Window (after clicking the **Setup File Name Fields** button):



Recording File Name Fields

Available Fields:
Double-Click or Hilite+Click Add Button)

User Pre-Named Text
Auto Serial Number
Recording Start Date
Recording Start Time
PC Name
User Name
Video Encoding Type
Video Frame Size
Video Bitrate
Video TV Format
Video CBR
Device Number

Automatic Start Serial No. from: 0

Field Separator: _ (Unders

Selected Fields:

User Pre-Named Text
Recording Start Date
Recording Start Time
Video Encoding Type
Video Frame Size
Video Bitrate

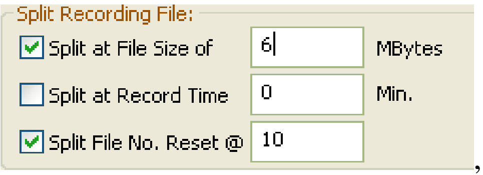
User Pre-Named Text: MPEGRecord1

Each Field in file name can be used at most once. "**Field Separator**" is used to separate between two fields. When recording starts, duplicated file name will be silently overwritten without warning.

Note recorded file names will always be appended with **.mpg** as file name extension**.**

- **Split Recording File**:
  During MPEG file recording, current file can be closed and new file can be started. Automatic file splitting method can be pre-defined here: **Split at File Size** will split a new MPEG file when current recording file size reaches a certain MBytes, while **Split at Record Time** will split a new MPEG file when current recording file reaches a certain minutes. The split file name is formed by appending an 8-digit serial number (starting from 00000001) to the initial recording file name: each time a new file is split, this 8-digit serial number will increase by 1. If "**Split File No. Reset**" is set

to non-zero, this 8-digit serial number will reset to 1 when reaching this non-zero number. For example, using the following **Split Recording File** settings,



Split Recording File:

☑ Split at File Size of 6 MBytes

□ Split at Record Time 0 Min.

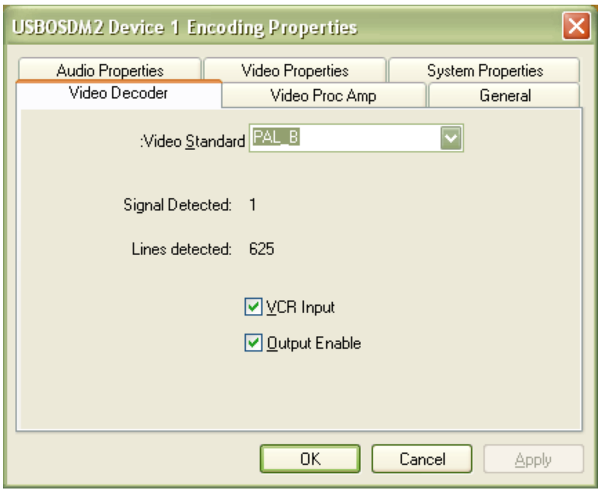
☑ Split File No. Reset @ 10

,

MPEG files recorded can have these names repeatedly with each file sized at approx. 6MBytes:
MPEGRecord1_20091026_151904_Video8000Kbps.mpg
MPEGRecord1_20091026_151904_Video8000Kbps_00000001.mpg
MPEGRecord1_20091026_151904_Video8000Kbps_00000002.mpg
… …
MPEGRecord1_20091026_151904_Video8000Kbps_00000010.mpg

Manual File Splitting can be done through the **Drop-down Menu->Split-Recording File**.

- **Encoding Properties**: This window is for setting up MPEG encoding options, including MPEG file format in **System Properties** tab window, MPEG Video Bit Rate, GOP Structure in **Video Properties** tab window, MPEG Audio Bit Rate and Sampling Rate in **Audio Properties** tab window, and overall Video Content Colours in **Video Proc Amp** tab window:



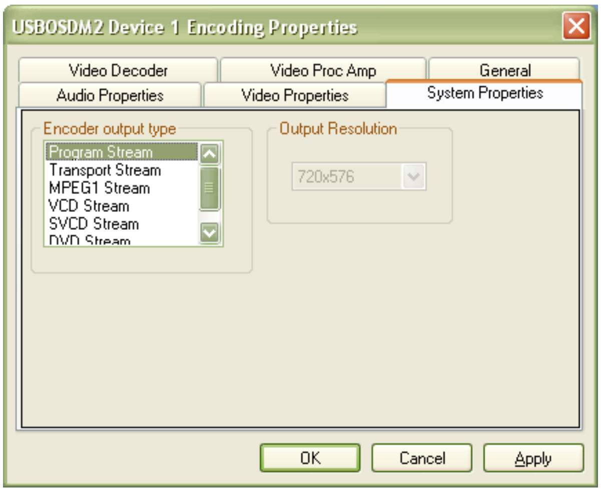
:Video Standard PAL_B

Signal Detected: 1

Lines detected: 625

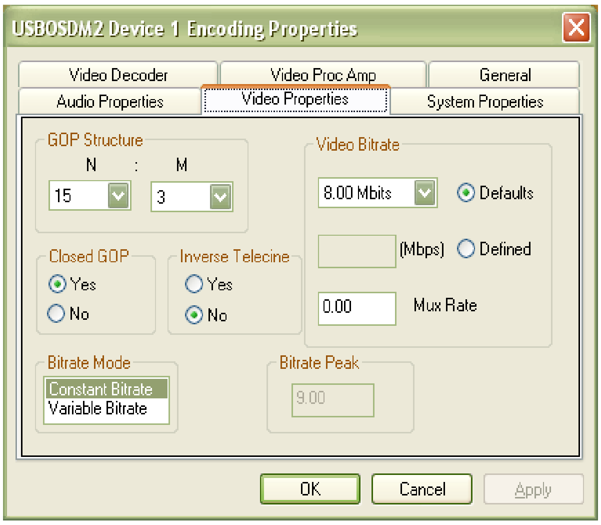
☑ VCR Input

☑ Output Enable



Encoder output type: Program Stream (selected), Transport Stream, MPEG1 Stream, VCD Stream, SVCD Stream, DVD Stream

Output Resolution: 720x576



GOP Structure N : M 15 3

Video Bitrate 8.00 Mbits ● Defaults

(Mbps) ○ Defined

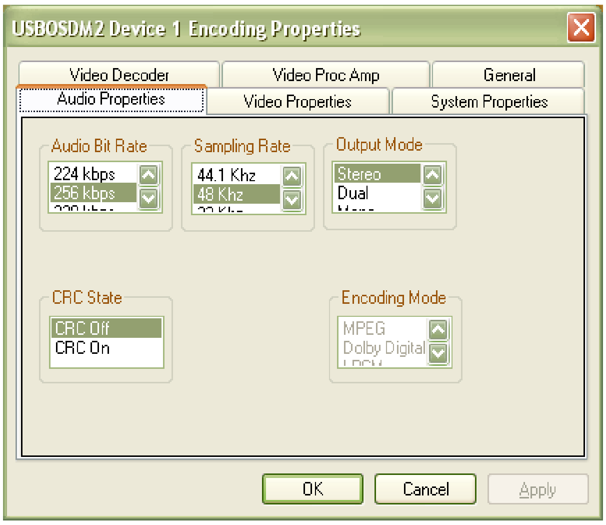
0.00 Mux Rate

Closed GOP ● Yes ○ No

Inverse Telecine ○ Yes ● No

Bitrate Mode: Constant Bitrate (selected), Variable Bitrate

Bitrate Peak 9.00



Audio Bit Rate: 224 kbps, 256 kbps (selected)

Sampling Rate: 44.1 Khz, 48 Khz (selected)

Output Mode: Stereo (selected), Dual

CRC State: CRC Off (selected), CRC On

Encoding Mode: MPEG, Dolby Digital

Several Notes on settings in these encoding properties windows:

Note 1: To create DVD/SVCD/VCD movie disks playable in stand-alone DVD players, DVD/SVCD/VCD encoding need to follow their respective standard settings:

DVD: Video Bit Rate: 4 ~ 10 Mbps, Audio Sampling Rate: 48 Khz
SVCD: Video Bit Rate: 2.5 Mbps, Audio Sampling Rate: 44.1 Khz
VCD: Video Bit Rate: 1.15 Mbps, Audio Sampling Rate: 44.1 Khz

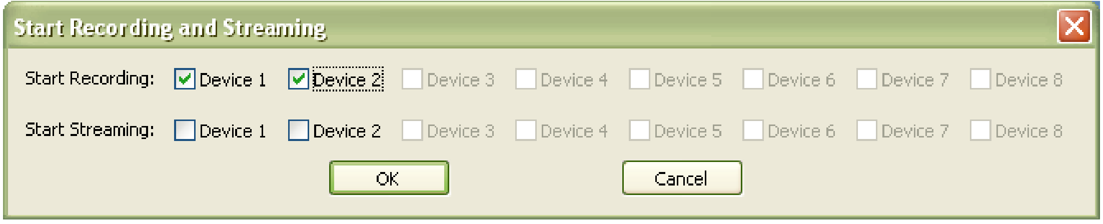
Note 2: In "**System Properties**" tab window, "**Program Stream**" and "**Transport Stream**" will have the same result: both create Program Stream MPEG2 video.

Note 3: Exiting from **Encoding Properties** Window will always cause a reset of the **M2B** device: the entire **Video Window** content will be re-drawn.

Note 4: The "**M2B Setup**" button under **Channel Setup** and **Device Setup** windows actually invoke this same "**Encoding Properties**" window.

b. Start, Pause, Stop Recording

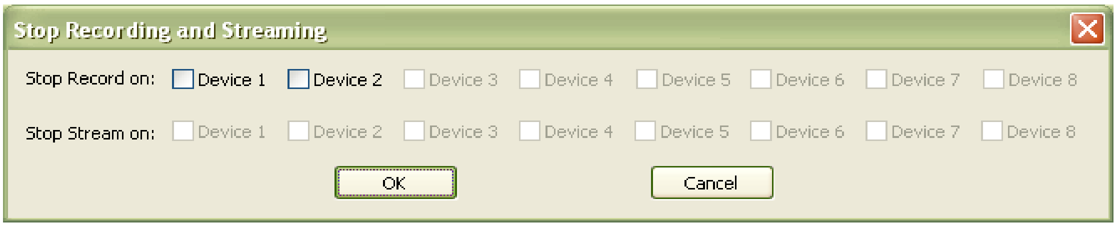
MPEG video recording can be started from **Drop-down Menu->Start Recording**, or from **Control Window->Record/Stream->Start Record/Stream**. **Drop-down Menu->Start Recording** always starts recording on one device, while **Control Window->Record/Stream->Start Record/Stream** selection can simultaneously start multiple **USBOSDM2** devices recording if they are available:


Start Recording and Streaming

Start Recording: ☑ Device 1 ☑ Device 2 □ Device 3 □ Device 4 □ Device 5 □ Device 6 □ Device 7 □ Device 8

Start Streaming: □ Device 1 □ Device 2 □ Device 3 □ Device 4 □ Device 5 □ Device 6 □ Device 7 □ Device 8

Similarly as starting record, manually stopping record can also be initiated either from **USBOSDM2**'s **Drop-down Menu->Stop Recording ------** which always stops recording on one **USBOSDM2** device, or from **Control Window->Record/Stream->Stop Record/Stream**, which allows stopping recording on multiple devices if they are present:


Stop Recording and Streaming

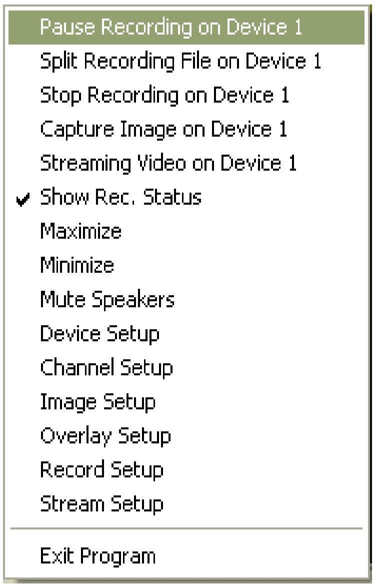
Stop Record on: □ Device 1 □ Device 2 □ Device 3 □ Device 4 □ Device 5 □ Device 6 □ Device 7 □ Device 8

Stop Stream on: □ Device 1 □ Device 2 □ Device 3 □ Device 4 □ Device 5 □ Device 6 □ Device 7 □ Device 8

.

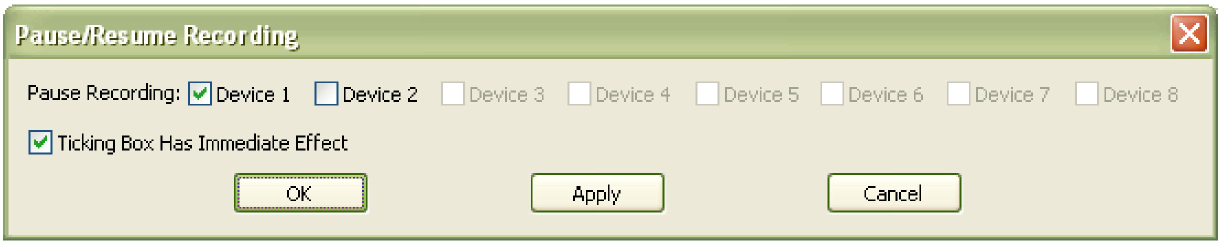
When **Timer** has non-zero value, recording will stop automatically when timer expires.

During video recording process, select **Drop-down Menu->Pause Recording** will temporarily pause writing data to the recording file without closing the file:


Pause Recording on Device 1
Split Recording File on Device 1
Stop Recording on Device 1
Capture Image on Device 1
Streaming Video on Device 1
✓ Show Rec. Status
Maximize
Minimize
Mute Speakers
Device Setup
Channel Setup
Image Setup
Overlay Setup
Record Setup
Stream Setup
Exit Program

Paused recording can be resumed by selecting **Drop-down Menu->Resume Recording**.

Pause/Resume can also start from the **Control Window->Record/Stream->Pause Record** window:


Pause/Resume Recording

Pause Recording: ☑ Device 1 □ Device 2 □ Device 3 □ Device 4 □ Device 5 □ Device 6 □ Device 7 □ Device 8

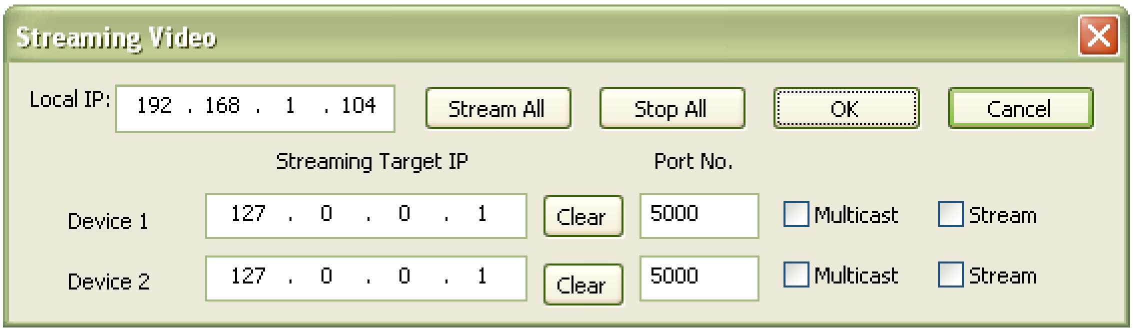
☑ Ticking Box Has Immediate Effect

12. Streaming Video

a. Setup Streaming

USBOSDM2 can act as a Streaming Server sending out MPEG video over IP network in UDP format.

The **Streaming Video** Window can be brought up either from **Drop-down Menu->Stream Setup**, or from **Control Window->Setup->Stream Setup**:


Streaming Video

Local IP: 192 . 168 . 1 . 104

	Streaming Target IP		Port No.		
Device 1	127 . 0 . 0 . 1	Clear	5000	□ Multicast	□ Stream
Device 2	127 . 0 . 0 . 1	Clear	5000	□ Multicast	□ Stream

To uniquely identify a receiving party for video streaming, an **IP Address** and a **Port Number** need to be supplied. **USBOSDM2** can stream out MPEG video in either **Multicast** or **Uni-cast** UDP mode: Multicast streaming allows multiple receiving parties to receive the same MPEG video simultaneously, while Uni-cast allows only one receiving party at a time. To stream in Multicast mode, a Multicast address (usually in the range of 224.0.0.0 ~ 239.255.255.255) must be entered in the IP Address field under the "**Streaming Target IP**" title, and the **Multicast** box must be ticked. The default mode is Uni-cast streaming.

b. Start and Stop Streaming

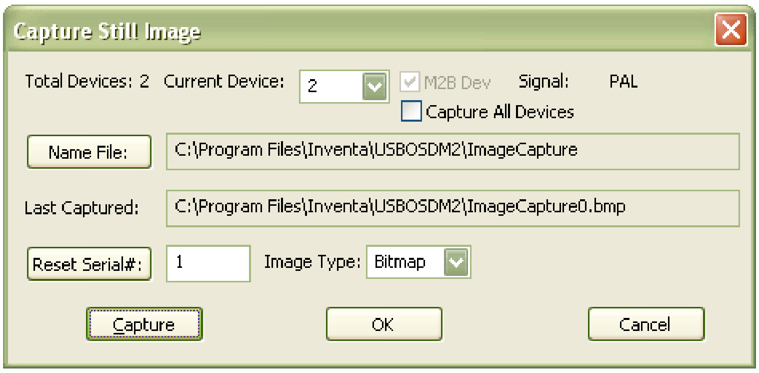
In the **Streaming Video** Window, ticking or clearing the □ Stream check box will start or stop streaming on one **USBOSDM2** device, clicking the "**Stream All**" or "**Stop All**" button will start or stop streaming on all available **USBOSDM2** devices. Alternatively, one device streaming can start or stop by selecting the **Drop-down Menu->Streaming Video** or **Drop-down Menu->Stop Streaming Video.**

Note video streaming operation is independent of video recording process.

MPEG playback devices or software such as Inventa's MPEGIO card or the excellent freeware VideoLan etc., can be used to receive **USBOSDM2**-streamed video in real-time over IP network.

13. Grab Still Image

Still image grabbing creates graphics file from the current video frame. The **Capture Still Image** setup window can be brought up from either **Drop-down Menu->Image Setup** or from **Control Window->Setup->Image Setup**:



Capture Still Image

Total Devices: 2 Current Device: 2 ☑ M2B Dev Signal: PAL

□ Capture All Devices

Name File: C:\Program Files\Inventa\USBOSDM2\ImageCapture

Last Captured: C:\Program Files\Inventa\USBOSDM2\ImageCapture0.bmp

Reset Serial#: 1 Image Type: Bitmap

In this window, "**Name File**" defines folder and file names for the still image, "**Reset Serial#**" set up a new number to be the next serial number appended to the newly created still image file's name.

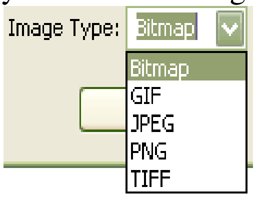


Image Type: Bitmap

Graphics File type is defined by the **Image Type combo box:** . If multiple **USBOSDM2** devices are present and "**Capture All Devices**" box is ticked, clicking the **Capture** button will simultaneously capture still images on all devices, otherwise one single image will be captured for the current device.

To capture still image on one device, **Drop-down Menu->Capture Image** selection can also be used.

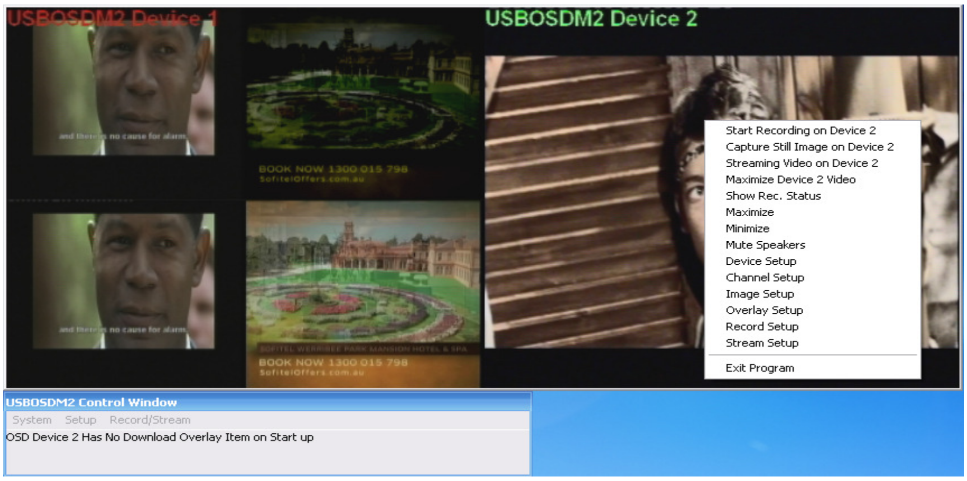
14. Other Drop-down Menu Selections

- **Show Rec. Status:** Enable recording status display inside each **USBOSDM2** device's video frame within the **Video Window.**
- **Maximize Device # Video:** This only appears when multiple **USBOSDM2** devices are present -- selecting this item will display the number '#' device's video in full screen, same as double-clicking number '#' device's video area inside the **Video Window** with **Ctrl** key pressed.
- **Maximize:** Display the **Video Window** as **Full Screen** (same as left mouse double-clicking in the **Video Window** without holding down **Ctrl** key). To restore back to normal window mode, left mouse double-click again or press Space Bar.

- **Minimize:** Change the program windows into an icon on Window’s Task Bar: USB OSD. To restore back to normal window mode, left mouse click the icon on the Task Bar.
- **Select Overlay to Move:** This selection only appears when overlay items have been created for one **USBOSDM2** device and the “Disable Overlay” box was not ticked on the “**Overlay Setup**” Window: details are in the “**Move Overlay Item on Video Frame**” sub-section under the “**Overlay Setup**” Window section.
- **Start/Stop Count (Ctrl+C):** Start/Stop **Counter** Timer if it is defined.
- **Mute Speakers:** Mute PC speakers for a **USBOSDM2** device, will not affect audio in recording**.**
- **Exit Program**: Quit **USBOSDM2** application software.

15. Use Multiple Devices

When multiple (2~8) **USBOSDM2** devices are connected to one PC, their video frames will all be displayed inside the same **Video Window**: all devices’ video frames are horizontally arranged from left to right with equal width. When one device’s video frame area is right-mouse single-clicked, the **Drop-down Menu** will reflect that device’s current status: if it is recording, if recording is paused, etc. When operations such as **Start Recording, Capture Image,** etc. are selected from the **Drop-down Menu**, only that device will start the selected operation.



OSD Device 2 Has No Download Overlay Item on Start up

To start/pause/resume/stop recording or streaming simultaneously on more than one devices, use the menu items under the **Record/Stream** Menu on the **Control Window**.

With multiple devices connected, double-clicking left mouse for **Full Screen** will have two results: if the **Ctrl Key** is pressed when double clicking one device’s video frame area inside the **Video Window**, this **USBOSDM2** device’s video frame will occupy the entire PC screen; if the **Ctrl Key** is NOT pressed when double clicking anywhere inside the **Video Window**, the PC screen will be filled with **Video Window**’s content: all devices’ video frames with equal width from left to right.

Please Note: multiple **USBOSDM2** devices can consume PC’s CPU usage quickly: avoid using too many **USBOSDM2** devices simultaneously if your PC’s CPU usage reaches 100%.

16. Command Line Parameters

At start up**, USBOSDM2** application software accepts some **command-line-parameters** so that it can enter certain operation mode once started. **Command-line-parameters** are supplied in the form of:

–Cmd devNum Value

Where **Cmd** is a single letter (case sensitive) command, this field must always be supplied;
devNum is the numerical device number(0 for first device), this field must always be supplied;
Value is the value needed for **Cmd**, this is an optional field depending on **Cmd**'s content.

Currently supported **Command-line-parameters** are:

-r devNum: start recording on device "devNum"
-s devNum: start streaming on device "devNum"
-f devNum filename: use **filename** as recording file name for device "devNum", note if **filename** contains spaces the entire string must be double-quoted
-p devNum pathname: use **pathname** as recording path name for device "devNum", note if **pathname** contains spaces the entire string must be double-quoted
-t devNum timerVal: use **timerVal** as recording timer (in Minutes) for device "devNum"
-d: start the program without reading the USBOSDM2.ini file, i.e., use default values for all parameters (see next section about default parameter values)
-u: start the program in Full Screen mode
-m: start the program in minimized mode
-k: start the program with PC speakers muted for all devices
-x: set the "**Rec. Timer Expire Exit Program**" option to true
-w: set the "**Rec. Timer Expire Shutdown PC**" option to true

Some examples:

USBOSDM2.exe –r 0 –f 0 record0.mpg --- start recording on device 1 to file record0.mpg
USBOSDM2.exe –s 0 –d --- start streaming on device 1, do not read USBOSDM2.ini file at start
USBOSDM2.exe –r 0 –r 1 –s 0 –s 1 --- start recording and streaming on device 1 and device 2
USBOSDM2.exe –r 0 –p 0 C:\\dev1 -f 0 rec.mpg --- record on device 1 to file c:\dev1\rec.mpg
USBOSDM2.exe –r 1 –t 1 120 –x --- start recording on device 2 for 2 hours then exit the program
USBOSDM2.exe –r 0 –t 0 60 –w --- start recording on device 1 for 1 hour then shut down the PC

17. Default Parameter Values

USBOSDM2 software uses an initialization file "**USBOSDM2.ini**" to store values for all of its user-definable parameters: each time when the software exits, values of these parameters will be saved into **USBOSDM2.ini** file which resides in the same folder as the **USBOSDM2.exe** program file. Each time when **USBOSDM2.exe** program starts it uses this file's contents to assign values to all of its parameters. If the **USBOSDM2.ini** file does not exist (such as when **USBOSDM2.exe** is started on a PC for the first time), or if the **Ctrl Key** is held down when the **USBOSDM2.exe** software is launched, the software will use the following **default values** for its parameters:

Video Input Channel Parameters:

- Window Common Position: 4 Channels (Split with each channel occupies 1/4 of the video frame)
- Window Cropping : For PAL: Left=15, Top=10, Width=720, Height=576
  For NTSC: Left=15, Top=12, Width=720, Height=480
- Disable Video In: No
- Input Source: Chan1=Input1, Chan2= Inpu2, Chan3=Input3, Chan4=Input4
- Channel Boundary: None
- Encoding Video Standard (NTSC or PAL): User Selectable on Program Startup
- Auto Rectify Height: Yes
- Mirror: No
- On Top: Yes

Audio Input Channel Parameters:

- Channel Source: Line-in
- Mute: No
- Left Gain: 70dB
- Right Gain: 70dB

Overlay Item Parameters:

- Font: Arial Regular 18 Point Yellow
- Start X/Y: 0, 0
- Use Downloaded Font: No
- Download Item on Start: No
- Foreground Colour: Yellow
- Background Mode: Transparent
- Alpha: None
- Blink: None
- Disable Overlay: No
- Timer Format: Time Only

Recording File Parameters:

- Recording Path: Same as USBOSDM2.exe file's path
- Recording File Naming Method: Prompt Before Recording
- User pre-named Text Recording File Name Field: MPEGRecord
- Split Recording File at File Size: 0 (No splitting)
- Split Recording File at Record Time: 0 (No splitting)
- Split File No. Reset: 0 (No Reset)
- Recording Timer: 0 (No Timer)

MPEG Encoding Parameters:

- Encoding Video Standard: User Selectable on Program Startup
- MPEG Encoding Output Type: DVD Stream
- MPEG Encoding Video Output Resolution: 720X576-Pixel PAL, 720X480-Pixel NTSC
- MPEG Encoding Video Bit Rate: 8.00 Mbps
- MPEG Encoding Bit rate Mode: Constant Bit Rate (CBR)
- MPEG Encoding GOP Structure: N==15, M==3
- MPEG Encoding Audio Bit Rate: 224 Kbps
- MPEG Encoding Audio Sampling Rate: 48KHz
- MPEG Encoding Audio Output Mode: Stereo

Video Streaming Parameters:

- Streaming Target IP Address: 127.0.0.1
- Port Number: 5000
- Multicast Streaming: No

Image Grabbing Parameters:

- Name File: ImageCapture.bmp in the same folder as USBOSDM2.exe
- Serial#: 1
- Image Type: Bitmap (.bmp)

Generic Parameters:

- PC Speakers Muted: No
- PC Speakers Volume: Maximum
- Show Rec. Status: Yes
- Status Transparent: Yes
- Status Start Line: 0
- Zoom Video: Disabled
- Confirm on Exit: Yes

- Rec. Timer Expire Exit Program: No
- Rec. Timer Expire Shutdown PC: No
- Colour at No-Channel-Area: 0 (Gray)
- DirectX Settings Sample Format: InterleavedEven1st
- Deinterlace Mode: Mode 1
- Colour Bar: Off
- SVideo Link: Off
- TV2 on YX: Off

18. Menu Hotkeys

For System Menu:

M: Maximize
N: Minimize
X: Exit Program
A: About Dialog

For Setup Menu:

D: Device Setup
C: Channel Setup
I: Image Setup
O: Overlay Setup
R: Record Setup
S: Stream Setup
X: Exit Program

For Record/Stream Menu:

P: Pause Record
R: Start/Stop Record
U: Setup Record

For Drop-down Menu:

A: Capture Still Image
C: Channel Setup
Ctrl+C: Start/Stop Counter Timer
D: Device Setup
E: Start/Resume Recording Video
G: Start/Stop Streaming Video
I: Image Setup
K: Mute PC Speakers
L: Split File for Record
M: Maximize
N: Minimize
O: Overlay Setup
P: Pause Recording
R: Record Setup
S: Stream Setup
T: Stop Record
W: Show Recording Status
X: Exit Program
Z: Maximize Device # Video

19. Technical Discussions

(1) Some PCs' **Screen Saver** or **Power-Down Screen** Settings could cause stopping on live video preview and record – if this happens, just disable Windows' Screen Saver / Power-Down Settings.

(2) On Windows 7 and Windows Vista, **avoid pressing Ctrl+Alt+Del key-combination** since this will stop video preview and record. Press **Ctrl+Shift+Esc** key combination instead to start TaskManager.

(3) Windows' **MediaPlayer** could fail to play some MPEG1 video files: to replace it use free video players such as VideoLan(http://www.videolan.org) or MediaPlayer Classic(http://mpc-hc.sourceforge.net) etc.

(4) Windows' default **"MPEG Audio Decoder"** (as part of quartz.dll) can often fail to properly decode MPEG1 files' audio: resulting in Windows' MediaPlayer giving corrupted sound on playing MPEG1 files – this can be fixed by making MediaPlayer to use a different MPEG Audio Codec Filter, such as the free "**MADFilter.ax**" (http://sourceforge.net/projects/maddxshow/) for Windows XP and Vista, or the Microsoft MPEG-1/DD Audio Decoder Filter "**msmpeg2adec.dll**" for Windows Vista/7, etc.: after registering these filters using regsvr32.exe, set their Merit value (using free tools such as RadLight Filter Manager or GSpot etc.) higher than the Merit value 0x03680001 of the default MPEG Audio Decoder, then reboot Windows.

(5) To use third-party DirectShow-enabled software such as VideoLan(http://ww.videolan.org) etc. to access the uncompressed analogue video on PC, click the "**Disable M2B Device**" button on the **Device Setup** Window to disable the DirectShow graph built by **USBOSDM2** application software**.** Note in this application software only one **M2B** device can be disabled at a time --- **USBOSDM2 SDK** will be needed to disable multiple **M2B** devices and use DirectShow filters: details can be found at the "**Using DirectShow Filters with the SDK**" section of the **USBOSDM2 SDK User Manual** .

20. USBOSDM2 Hardware Specification

Host Interface: 2 X USB2.0 Type B Sockets
Power Supply: through USB Cables
Video Input: 5 X Composite (RCA), 1 X SVideo (4-Pin Mini-DIN)
Video Output (for Real-time Monitoring): 2 X Composite (RCA)
Audio Input: 4 X Line-in 3.5mm Stereo Mini Socket, 2 X Microphone 3.5mm Stereo Mini Jack
Audio Output: 2 X Line-out 3.5mm Stereo Mini Socket
Encoded Video Formats: MPEG2, MPEG1 MP@ML, Program Stream / System Stream
Constant Bit Rate (CBR) and Variable Bit Rate (VBR) Encoding
Video 4:2:2 to 4:2:0 Conversion
Video Inverse telecine (3:2 pulldown)
Video Encoding Frame Rates: 25 fps, 29.95 fps
Video Encoding Bit Rates: 1.00 Mbps ~ 25.00 Mbps
Video Encoding Resolution in Pixels: PAL: 352X288,480X576,720X576, NTSC: 352X240,480X480,720X480
Video Encoding Aspect Ratio: 4:3
Audio Encoding Format: MPEG1 Layer 2
Audio Sampling Rates: 32KHz, 44.1KHz, 48Khz
Audio Encoding Bit Rates: 192Kbps, 224Kbps, 256Kbps, 320Kbps, 384Kbps
Device Dimension: Top Width 138mm, Bottom Width 168mm, Depth 120mm, Height 40mm